

MASS. EA 20.2:IN 2



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL  
PROTECTION**

**Selected Federal and State Grant Funded**

**INDICATIVE PROJECT SUMMARIES**

**FFY 1996-2000**



**Lauren A. Liss, Commissioner**

**Arleen O'Donnell, Assistant Commissioner  
Bureau of Resource Protection**

**Andrew Gottlieb, Director  
Division of Municipal Services**

**Glenn Haas, Director  
Division of Watershed Management**



# **MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

## **INDICATIVE PROJECT SUMMARIES: 104(b)(3), 604b, 319h, MWI Grant-funded Projects.**

**For the period**

**FFY 1996-2000**

**Massachusetts Department of Environmental Protection**

**Lauren A. Liss, Commissioner**

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Bureau of Resource Protection**

**Andrew Gottlieb, Director  
Division of Municipal Services**

**Glenn Haas, Director  
Division of Watershed Management**

**January 15, 2000**

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A complete list of reports published since 1963 is updated annually and printed in July. This report, entitled, "Publications of the Massachusetts Division of Watershed Management, 1963 - (current year)", is also available by writing to the DWM in Worcester.



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## Introduction

Contained within this document are all *Indicative Project Summaries* for the period between Federal Fiscal Year 1996 (October 1, 1995 through September 1996) and Federal Fiscal Year 2000 (October 1, 1999 to September 30, 2000), for 104(b)(3), 604b, 319(h) and (I) and the Massachusetts Watershed Initiative (MWI) grant funded projects. These are listed in a table of contents, organized into 3 sections compiled by basin. For your convenience and speedier response times, and to achieve our goals of paperwork reduction, we urge you to use the on-line versions if you have the capacity and ability to do so. **If you are unable to view or download these documents, you may contact Ron Maribett at (617) 556-1127.**

### **Section I. 104(b)(3): Water Quality and Wetland Program FFY 96 and FFY99**

This section presents brief descriptions of the Department of Environmental Protection (DEP) projects financed under Section 104(b)(3) Clean Water Act Wetlands and Water Quality competitive and base grant program during federal fiscal years 1996 through 1999. Section 104(b)(3) of the Clean Water Act of 1977 authorizes the awarding of funds to states for the prevention, reduction, and elimination of pollution in wetlands and waters of the United States. Prior to 1997, each New England state submitted their priority projects to the US EPA Region 1 Headquarters for review and approval. Grant funds under the 104(b)(3) program are made available to Massachusetts Agencies under the National Environmental Performance Partnership Agreement (NEPPA) with the US EPA. These grants are administered by the Department of Environmental Protection, Bureau of Resource Protection.

The NEPPA emphasizes a results oriented approach to focus attention on environmental protection goals and the efforts to achieve them. Water quality and wetland protection goals as outlined in the Performance Partnership Agreement include:

- Ensure that every public water supply consistently provides water that is safe to drink;
- Reduce, eliminate, and/or control both point and non-point discharges to surface and ground water;
- Reduce and reverse acidification of water bodies in Massachusetts and other jurisdictions affected by Massachusetts and transported  $\text{SO}_x$  and  $\text{NO}_x$  emissions;
- No-net-loss of wetland resources;
- Minimize unpermitted filling and/or alteration of wetlands;
- Minimize indirect degradation of wetland functions from stormwater runoff; and
- Discourage projects in or directly adjacent to wetlands.

Additional statewide or watershed specific priorities may be established by the Department annually. All Massachusetts Executive Office of Environmental Affairs (EOEA) Agencies developing or implementing projects to achieve these water quality or wetland goals are eligible to submit grant proposals. Each submittal must clearly identify the state agency contact who will bear primary responsibility for overseeing the project if funded. Any assessment work proposed under this program must be consistent with either the Basin Water Quality Management Plan recommendations or the 5-year Basin Cycle.

Non-profit organizations such as watershed associations, regional planning agencies, and Universities are eligible to submit proposals through an EOEA sponsoring agency. Their proposals must clearly identify both the state agency co-sponsor and the EOEA principal contact who will bear primary responsibility for the project.

Proposals submitted for Clean Water Act Section 104(b)(3) wetlands projects must identify a 25 % non-federal match (25% of total project cost). State funded in-kind services can be provided as the non-federal match. Projects should be results oriented and consistent with water quality and wetland goals, wetland & watershed restoration plans, and basin water quality management plans.

Each year DEP issues a Request for Submittals (RFR) for competitive projects to be funded through 104(b)(3). The RFR highlights the schedule for each step of the application process, proposal content requirements, and any watershed-specific priorities. **Applicants are encouraged to contact Gary Gonyea of DEP with any questions regarding project eligibility or other RFR matters.** DEP staff will work with each applicant to develop proposals that are consistent with DEP's resource protection goals and management strategies. Proposal evaluation criteria generally include: clarity and completeness of proposal, likelihood of success, success of previous projects, results oriented



project, and consistency with wetland and water quality goals, wetland and watershed restoration plans, and basin water quality management plans.

While many projects are basin-specific, some have a statewide perspective and focus on program development or enhancement. New, innovative approaches to addressing wetland and water quality problems have been funded through Section 104(b)(3) such as the Circuit Rider approach, training programs for new wetland delineation methodologies, and revised 401 Water Quality Certification regulations which streamlined the application and permitting process. These and other projects have resulted in state regulatory programs adopting new ways of doing business and increased protection of the Commonwealth's wetland and water resources.

## **Section II. 604b: Water Quality Management Planning FFY96 to FFY**

This report presents **Indicative Project Summaries** of projects partially financed under the **604b Water Quality Management Planning Grants Program** during the federal fiscal years of 1996 - 1999.

Section 604b of the Federal Clean Water Act authorizes the awarding of funds through the U.S. Environmental Protection Agency (EPA) to states for water quality assessment and management planning grants. In Massachusetts the 604b program is administered by the Department of Environmental Protection, Bureau of Resource Protection.

The 604b Grant Program is designed to assist eligible recipients in providing water quality assessment and planning assistance to local communities. Prior to 1995 the 604b Grant awards focussed primarily on water supply protection and planning projects. In 1995 the Department directed the focus of the 604b program towards watershed or subwatershed based nonpoint source assessment type projects. Priority is given to projects that provide diagnostic information to support the Department's basin-wide water quality management activities. The assessment activities provide information useful in the development of recommendations relative to future nonpoint source pollution best management practice (BMP) implementation projects, the water withdrawal permitting process, drinking water source protection, and/or management strategies for restoration and protection of surface and groundwater resources.

Each year the Department issues a Request for Response (RFR) for competitive projects to be funded under the 604(b) program. Eligible respondents include regional planning agencies, councils of governments, conservation districts, counties, cities and towns, and other substate planning agencies and interstate agencies. Priority is given to projects located in one (or more) of the priority watersheds targeted for assessment work as defined by the Department, and involve assessment and planning activities such as: assessment of local water quality protection measures; assessment of land use activities; assessment of local environmental awareness and concerns; water quality assessment; water supply/water quality source protection planning, and water supply development planning. Matching funds are not required under the 604b Grant Program, however proposals are enhanced by offering additional cash or in-kind services as demonstrations of local support. **Applicants are encouraged to contact Gary Gonyea @ (617) 556-1152 with any questions on project eligibility.**

## **Section III. 319(h): Nonpoint Source Projects FFY96 to FFY00**

This section presents **Indicative Project Summaries** projects partially financed through the **Massachusetts Nonpoint Source Competitive Grants Program** during federal fiscal years 1996 through 2000

Each year Congress appropriates funds under Section 319 (s319) of the Clean Water Act of 1987 (33 U.S.C.A., Sec. 1251 et. seq.) to assist states in implementing their approved nonpoint source (NPS) programs. Section 319 is administered by the U.S. Environmental Protection Agency (EPA), which oversees the awards to individual states. The Massachusetts Department of Environmental Protection, Bureau of Resource Protection administers this award as part of the Massachusetts Nonpoint Source Program.

The s319 program focuses on the implementation of activities and projects for the control of nonpoint source pollution. EPA defines NPS pollution as that which is "caused by diffuse sources that are not regulated as point sources and are normally associated with precipitation and runoff from the land or percolation." The awards are intended to be financial support for the state's programs for controlling the major state-wide categories of NPS pollution or for protecting or improving NPS impaired or threatened targeted water resources.

Each year a portion of the s319 funds awarded to a state are used for specific watershed implementation projects which improve or protect threatened or impaired priority freshwater and coastal waters, including groundwater. A Request for

Proposals for competitive projects is issued by the Massachusetts Department of Environmental Protection each year. Proposals may be submitted by any interested Massachusetts public or private organization. All eligible proposals are reviewed by an internal screening committee. Evaluation criteria include, but are not limited to: nature, extent, severity, and understanding of the NPS problem; probability of success; projected benefits; local support and participation; interagency participation, cooperation and commitment; local funding; amount of funds requested. Projects selected by the Department for funding are included in the Department's yearly program plan which is submitted to EPA prior to the start of the federal fiscal year (FFY). Once the program plan has been approved, the Department may then proceed to enter into a contractual agreement with the proposal proponent to conduct the project.

To be eligible to receive funding a 40% non-federal match is required from the grantee. This match may be cash or from in kind services performed as part of the approved project activities. Research, program development, assessment, planning, and water quality monitoring for assessment purposes are not considered implementation activities and are not eligible for s319 funding or match credit. **Applicants are encouraged to contact Beth McCann @ (617) 556-1152 with any questions on project eligibility.**

#### **Section IV. MWI Grant Funded Projects for FY99**

This section presents Indicative Project Summaries of projects funded by the Massachusetts Watershed Initiative Program and administered by the Massachusetts Department of Environmental Protection (DEP) in State Fiscal Year 1999.

Annually, EOEa Watershed Team Leaders, in conjunction with State and Federal agencies, municipal governments and regional planning agencies, universities, local watershed associations, businesses and other groups develop transitional work plans that identify the most important goals for each watershed and the specific projects and programs which will be needed to meet those goals.

The Massachusetts Department of Environmental Protection is designated as a "Lead Agency" to implement some of these MWI priority projects identified by the Teams. Other EOEa agencies such as the Departments of Environmental Management, Fisheries, Wildlife and Environmental Law Enforcement, Food and Agriculture, and the Metropolitan District Commission are serving as leads on implementing other projects and activities.

The watershed priority projects administered by DEP and described herein address issues relating to water quality, open space and growth planning, and technical assistance and outreach. . **Applicants are encouraged to contact Arthur Screpetis @ (508) 767-2875 with any questions on project eligibility.**



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98-04/104	Stormwater Multi-Watershed Study	23

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**Watershed North Coastal**

Project Number	Project Title	
97-01/104	Stormwater & NPS Impacts to Wetlands	9
97-08/104	Salem Sound Nutrient Monitoring	16
96-02/604	Gloucester On-Site Sewage	40
99-11/MWI	North Coastal Watershed Assessment	110

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**Watershed Parker**

<b>Project Number</b>	<b>Project Title</b>	
99-07/104	Microbial Contamination of Freshwater Beaches	36
98-02/604	Little River NonPoint Source Assessment	48

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<b>Watershed</b>	<b>Quinebaug</b>	
<b>Project Number</b>	<b>Project Title</b>	
97-09/104	Numeric Biocriteria	17

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<b>Watershed</b>	<b>Shawsheen</b>	
<b>Project Number</b>	<b>Project Title</b>	
99-06/MWI	Shawsheen River GIS Storm Drains and Solutions	105

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<b>Watershed</b>	<b>South Coastal</b>	
<b>Project Number</b>	<b>Project Title</b>	
98-08/319	Protection of First Herring Brook	78
99-07/MWI	South Coastal Eel River Task Force	106
99-12/MWI	South Coastal Unmapped Streams	111
99-13/MWI	South Coastal Technical Assistance Outreach Pilot	112

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<b>Watershed</b>	<b>Statewide</b>	
<b>Project Number</b>	<b>Project Title</b>	
96-01/104	Development of Economics Model for Watershed Management	1
96-03/104	Technical Assistance to Implement Components of the New Massachusetts Source Water Protection Program	3
96-04/104	Pilot Study for the Development of Numeric Biocriteria	4
96-05/104	National Pollutant Discharge Elimination System(NPDES) Delegation	5
96-06/104	Development of Comprehensive Resource Assessment Database in Support of the Integrated Water Quality Management Program	6
96-07/104	Bordering Vegetated Wetlands Delineation Video	7
96-08/104	Small Docks & Piers Guidance Document	8
97-02/104	Clear Water Estates	10
97-03/104	Assessment Priority Wetland and Riparian Habitat	11
97-05/104	Biomonitoring Support for Watershed Management	13
97-10/104	Source Water Protection Project	18
98-02/104	TMDL Modeling for Priority Basins	21
98-05/104	QAPP Monitoring Support	24
98-06/104	Protocols for MacroInvertebrate Impact Assessment	25

98-08/104	Continue Assessment Priority Wetland & Riparian Habitats	27
98-09/104	Wetlands Data Development & Information Transfer	28
98-11/104	TMDL Stormwater Development Support	30
99-01/104	TMDL Monitoring Support	31
99-02/104	Biomonitoring Support	32
99-03/104	TMDL Outreach	33
99-06/104	Lake Surveys for TMDL Development	35
99-08/104	Inland Mosquito Control SOP's	37
99-09/104	Wetlands Compliance and Enforcement	38
96-01/319	Septic System Management 2000	54
98-09/319	Manual I/A WWTP Technologies	79
98-11/319	Greywater Demonstration Project	80
98-12/319	Eelgrass Demonstration Project	81
99-01/319	Alternative Septic System Testing Center	82
99-06/319	Development of Recharging Stormwater Control Structures	86
99-07/319	Development of Design Guidance for Shallow Trench	87
99-09/319	Agricultural NPS BMP Outreach	89
99-16/MWI	Technical Assistance Water Quality Assessment I	115
99-17/MWI	Technical Assistance Water Quality Assessment II	116
99-18/MWI	Seasonal Support Water Quality/Laboratory	117
00-02/319	Alternative Septic System Test Center	91
00-03/319	Rapid Field Test for Stone Aggregate	92
00-06/319	Dairy Farm NPS Management	95

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**Watershed                      Taunton**

<b>Project Number</b>	<b>Project Title</b>	
97-06/104	Develop Canoe River Aquifer GIS Map and Database	14
00-10/319	Shaw's Plaza Stormwater NPS Implementation	99

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**Watershed                      Ten Mile**

<b>Project Number</b>	<b>Project Title</b>	
99-08/MWI	Coles Brook Contamination	107

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**Watershed                      Westfield**

<b>Project Number</b>	<b>Project Title</b>	
97-09/104	Numeric Biocriteria	17
99-14/MWI	Westfield River Assessment	113



## APPENDIX B.

### PROJECT LISTING BY BASIN AND PROGRAM (1990-1995)

#### **Watershed            Blackstone**

<b>Project Number</b>	<b>Project Title</b>
90-01/104	Blackstone River Initiative
93-11/104	Completion of Blackstone River Initiative
93-12/104	Merrimack River Study
93-13/104	Rice City Pond Project

#### **Watershed            Boston Harbor**

<b>Project Number</b>	<b>Project Title</b>
94-06/604	Tri-Town Watershed Protection Implementation Project
95-01/104	Neponset River Watershed Modeling Project
95-11/319	Neponset River Fishway Project
*** 91-06/604	Charles River Southwest Regional Water Supply Protection Planning Project

#### **Watershed            Buzzards Bay**

<b>Project Number</b>	<b>Project Title</b>
95-03/319	Buttermilk Bay Storm Water Remediation Project
95-05/319	Demonstration of an Alternative On-site Wastewater Disposal System at Allen's Pond Wildlife Sanctuary

#### **Watershed            Cape Cod**

<b>Project Number</b>	<b>Project Title</b>
91-01/604	Control of Hazardous Materials Users to Protect Groundwater Quality on Cape Cod
91-02/604	Monomoy Lens Regional Water Protection Project
92-01/604	Cape Cod Small Volume Well Prioritization Project
94-01/604	Sagamore Lens Groundwater Protection Project

94-05/319	Alternative On-Site Septic Systems – Encouraging Their Use in Environmentally Sensitive Areas of Barnstable County
94-06/319	Orleans Storm Water remediation Project
95-02/319	A Demonstration Program to Mitigate Storm Drain Pollution Impacting Shellfish Beds
95-07/319	Title 5 Training for boards of Health in Five Towns in Barnstable County, MA
95-08/319	Swan Pond River Storm Water Remediation Project

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**Watershed Charles**

91-06/604	Charles River Southwest Regional Water Supply Protection Planning Project
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**Watershed Chicopee**

91-03/604	Quaboag River Water Supply Protection Project
91-04/604	Franklin county Water Resources Protection Planning Project
92-03/604	Franklin county Water Resources Protection Planning Project
92-08/604	Pioneer Valley Water Resources Protection Planning Project
93-02/604	Franklin County Water Quality Improvement Program
94-02/604	Small Public Water System Collaborative Project
94-04/604	Public Water Supply Technical Assistance/Watershed Inspection Implementation and ISTEA Planning Project

**Watershed Concord**

93-04/604	Sudbury-Assabet-Concord (SuAsCo) River Basins Water Supply Protection Project
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**Watershed Connecticut**

92-01/104	Connecticut River Combined Sewer Overflow Correction Project
92-07/604	Montachusett Water Resources Protection Planning Project
94-03/604	Cape Ann Emergency Water Supply Plan
95-01/604	Nonpoint Source Assessment in the Westfield River Watershed
95-01/319	Lake Lorraine and Five Mile Pond Nonpoint Source Project
95-06/319	Comprehensive Nonpoint Source Management in the Mill River Subwatershed, Hatfield, MA

**Watershed Deerfield**

92-09/604	Small Public Water Supplies Planning and Protection Project,
93-01/604	Technical Assistance to Community and Non-Transient Non-Community (NTNC) Water Suppliers in Preparing Source Protection Plans
95-04/319	Demonstration of Urban Pollution Control in the Green River

Watershed		
<b>Watershed</b>	<b>Farmington</b>	
	92-07/604	Montachusett Water Resources Protection Planning Project
	95-01/604	Nonpoint Source Assessment in the Westfield River Watershed
	95-02/604	Farmington River Watershed Nonpoint Source Assessment Project
<b>Watershed</b>	<b>Hoosatic</b>	
	92-09/604	Small Public Water Supplies Planning and Protection Project
	93-01/604	Technical Assistance to Community and Non-Transient Non-Community
	(NTNC)	Water Suppliers in Preparing Source Protection Plans Deerfield
	94-03/319	Green Soil Bioengineering Demonstration Project
<b>Watershed</b>	<b>Hoosic</b>	
	92-09/604	Small Public Water Supplies Planning and Protection Project,
	93-01/604	Technical Assistance to Community and Non-Transient Non-Community (NTNC) Water Suppliers in Preparing Source Protection Plans Deerfield
<b>Watershed</b>	<b>Ipswich</b>	
	92-06/604	Ipswich and North Coastal River Basins Water Resources Protection Planning Project
	95-04/604	Nonpoint Source Assessment in the Ipswich River Water
<b>Watershed</b>	<b>Islands</b>	
	92-04/604	Martha's Vineyard Water Resources Protection Planning Project
	94-08/319	Lake Tashmoo Storm Water Remediation Project
<b>Watershed</b>	<b>Merrimack</b>	
	91-02/104	Lowell BMP/Source Control Study
	93-05/104	Microbiological Quality of the Merrimack River
	91-05/604	Merrimack River Water Resources Protection Project
	91-08/604	Northern Middlesex County Water Resources Protection Project
	92-05/604	Merrimack Valley Regional Water Supply Protection Project
	93-03/604	Development and Implementation of Local Floor Drain Regulations in the Merrimack and Parker River Basins
<b>Watershed</b>	<b>Millers</b>	
	91-07/604	Upper Naukeag Lake Watershed Protection Study
	92-07/604	Montachusett Water Resources Protection Planning Project
<b>Watershed</b>	<b>Narragansett</b>	
	93-09/104	Runnins River Stormwater Abatement Plan
	94-05/604	A Regional Approach to Water Resources Protection and Protecting a Future Potential Water Supply
<b>Watershed</b>	<b>Nashua</b>	



	91-01/104	Reduction in Fitchburg Combined Sewer Overflows
	92-02/604	Fitchburg Watershed Planning Project
<b>Watershed</b>	<b>North Coastal</b>	
	92-06/604	Ipswich and North Coastal River Basins Water Resources Protection Planning Project
	94-05/104	Dry and Wet Weather Effects of Storm Drain Systems on Selected Massachusetts Shellfish Areas: The First Step in Correcting the Problem
	94-03/604	Cape Ann Emergency Water Supply Plan
<b>Watershed</b>	<b>Parker</b>	
	93-03/604	Development and Implementation of Local Floor Drain Regulations in the
	94-07/319	Mill River Nonpoint Source Management Project
<b>Watershed</b>	<b>South Coastal</b>	
	94-09/319	Jones River/Billington Sea Nonpoint Source Pollution Control Project
	95-03/604	South Shore Nonpoint Source Management Plan
<b>Watershed</b>	<b>Taunton</b>	
	91-09/604	Upper Taunton River Basin Water Supply Protection and Development Project
	91-11/604	Mattapoisett River Water Supply Protection Project
	92-10/604	Taunton River Basin Water Resources Planning Project
	93-05/604	Upper Taunton River Basin Water Supply/Contingency Planning Program
	93-07/604	Technical Assistance to the Palmer River Watershed, Mattapoisett River Valley Water Supply Protection Advisory Committee and the Taunton River Basin Needs Study
	94-05/604	A Regional Approach to Water Resources Protection and Protecting a Future Potential Water Supply
<b>Watershed</b>	<b>Westfield</b>	
	91-10/604	Pioneer Valley Water Resource Protection Project
	92-09/604	Small Public Water Supplies Planning and Protection Project
	93-06/604	Pioneer Valley Regional Water Supply Protection Project
	94-03/604	Cape Ann Emergency Water Supply Plan
	95-01/604	Nonpoint Source Assessment in the Westfield River Watershed
<b>Watershed</b>	<b>Statewide</b>	
	92-02/104	Wetlands Program Public Education and Outreach
	92-03/104	Integration of 401 Water Quality Certification Process into Wetlands Protection Program – Phase I
	92-04/104	A Two-Tiered Approach to Functional Assessment of Wetlands
	93-01/104	Implementation of Stormwater Permit Program
	93-02/104	Evaluation of Drinking Water Supply Contributions of Copper to Selected Wastewater Systems in Massachusetts
	93-04/104	Implement Clean Water Strategy by Targeting Stormwater controls and wetlands Impacts to Regain Use of Critical Resources Areas

93-06/104	Final Phase of Integrating the 401 Water Quality Certification into the Wetlands Protection Program
93-07/104	Cumulative Assessment
93-08/104	Development of Regulations for the 401 Water Quality Certification Process
93-10/104	Synthesize the NOAA Coastal Ocean Program Submerged Aquatic Vegetation Procedures with the conventions of the Department of Environmental Protection Wetland Conservancy Program
93-14/104	Watershed "2000" Statewide
94-01/104	Integrated Water Quality Management Program for Massachusetts
94-02/104	Integrating Surface Water Protection Concerns into the Massachusetts Comprehensive State Groundwater Protection Program (CSGWPP)
94-03/104	A Pilot Project Using Aquatic Macroinvertebrate Assessment for Targeting Priority River Basin Segments for TMDL Development
94-04/104	Utilizing Alternate Available Resources to Promote Water-Based Assessment and Permitting in Support of the Goal for Resource Protection
94-06/104	Circuit Rider Phase I – Targeted Public Outreach and Advanced Training for Conservation Commissions
94-07/104	Evaluation of Field Methodologies to Determine the 50% Wetland Line - Phase I
95-02/104	Title 5 Implementation and GIS Quality Control Study
95-03/104	Case Study for the Development of Numeric Biological Criteria for the Wadable Rivers and Streams of Massachusetts
95-04/104	Continuation of Circuit Rider Approach –Targeted Public Outreach and Advanced Training for Conservation Commissions
95-05/104	Wetland Delineation Methodology: Training for conservation Commissions and State Wetland Staff
94-01/319	Demonstration of Best Management Practices to Control Nonpoint Source Pollution from Forestry Operations
95-10/319	Developing and conducting Training Workshops on the Revised Regulations for M.G.L. CH 132, the Forest Cutting Practices Act, and M.G.L. CH 131, the Wetlands Protection Act

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**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 96-01/104**

**PROJECT TITLE:** Development of Economics Model for Watershed Management

**INVESTIGATOR:** Department of Environmental Protection

**LOCATION:** Statewide

**DESCRIPTION:** The purpose of this project is to develop economic models or tools to assimilate, organize and analyze information to evaluate the costs and benefits of various Watershed Management options. The model will help facilitate understanding the relationship between point and nonpoint sources of pollution and water withdrawals. Information for determining affordability and prioritizing programs to protect and restore water quality and stream flow in Massachusetts waterbodies will be synchronized and presented.

Specific tasks will include:

1. produce a detailed work plan;
2. conduct a literature review of economic modeling and analysis;
3. select and examine economic modelling "case studies" applications that were identified during the literature review in more detail and describe approaches applicable in Massachusetts;
4. develop test methodology for Massachusetts application including procedures to establish economic benefits of water quality and quantity improvements;
5. employ test methodology as part of the planning process for a Massachusetts watershed;
6. establish protocols for quality control, storage and use of project data;
7. document project results in draft and final reports; and
8. develop a plan for statewide implementation.

**COST:** \$138,000

**FUNDING:** \$70,479 by the U.S. Environmental Protection Agency  
\$67,521 by the Department of Environmental Protection

**DURATION:** 1996 – 1998



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 96-02/104**

**PROJECT TITLE:** Charles River: Swimmable in 2005

**INVESTIGATOR:** Charles River Watershed Association and Massachusetts Institute of Technology

**LOCATION:** Charles River Watershed

**DESCRIPTION:** The purpose of this project is to continue with Phase II of the Charles River Watershed Association's Integrated Monitoring, Modeling and Management Project. This project involves the monitoring of river flow conditions, water and sediment quality assessment, modeling hydrologic, water quality and economic conditions in the watershed, and the development of a watershed management plan.

Specific tasks will include:

1. modeling watershed and groundwater hydrology;
2. invertebrate assessments; and
3. identification and implementation of corrective actions to improve water quality and quantity problems.

**COST:** \$101,311

**FUNDING:** 100% by the U.S. Environmental Protection Agency

**DURATION:** 1996 – 1998

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 96-03/104**

**PROJECT TITLE:** Technical Assistance to Implement Components of the New  
Massachusetts Source Water Protection Program

**INVESTIGATOR:** Department of Environmental Protection

**LOCATION:** Statewide

**DESCRIPTION:** The purpose of this project is to provide individualized technical assistance and guidance materials to water suppliers statewide to address identified water supply protection needs. Targeted surface water sources include direct river withdrawals and small wells.

Specific tasks will include:

1. conduct community workshops to assist public surface water suppliers with developing a surface water protection plan;
2. conduct statewide workshops to promote watershed (river basin) approach to drinking water protection, development of multi-community emergency response procedures, and better communication and partnership development with business, agriculture and community groups;
3. verify and distribute GIS maps (maps to identify surface and groundwater sources, land uses, waste facilities, USTs, and permitted discharges) to all municipal groundwater suppliers to assist with local planning and protection efforts;
4. conduct new outreach efforts and distribute new educational materials to agriculture and business associations to promote voluntary water supply protection efforts; and
5. evaluate project success and transferability.

**COST:** \$44,050

**FUNDING:** 100% by the U.S. Environmental Protection Agency

**DURATION:** 1996 - 1997

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 96-04/104**

PROJECT TITLE: Pilot Study for the Development of Numeric Biocriteria

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: The purpose of this project is to provide the Department with a valid framework for the development of numeric biocriteria for streams and wadable rivers in Massachusetts.

This project will provide a sound basis for determining if biological community structure and function can be sufficiently described and consistently monitored with technically sound biosurveys to yield predictable -and repeatable - results so biocriteria derived from there can serve to protect the designated uses of wadable rivers and streams. The project will also determine how ecological subregion reference streams conserve as benchmarks of attainable water quality and to characterize pertinent reference conditions.

Specific tasks will include:

1. selection of referenced and impaired stream sites within three ecological subregions;
2. conduct fish, aquatic macroinvertebrate and habitat assessments at each site; and
3. evaluate and interpret fish, aquatic macroinvertebrate, and habitat assessment data to determine if it sorts into distinct site classes based on subcoregions and, possibly, stream size.

COST: \$83,694

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1996 - 1998



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 96-05/104**

PROJECT TITLE: National Pollutant Discharge Elimination System (NPDES) Delegation Project

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: This project will collect information to assist the Department develop a plan for NPDES delegation.

Specific tasks will include:

1. define NPDES program goals for Massachusetts through stakeholder involvement;
2. analyze current NPDES program structure and resource allocations;
3. evaluate alternative organizational structures, human resources and management approaches for a delegated program; and
4. estimate program costs associated with delegated program alternatives.

COST: \$110,000

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1996 - 1998

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 96-06/104**

PROJECT TITLE: Development of a Comprehensive Resource Assessment Database in Support of the Integrated Water Quality Management Program

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: The purpose of this project is to update, maintain and link DEP, Office of Watershed Management's water quality electronic databases. This effort will provide a comprehensive assessment of water quality and quantity conditions and will support the River Basin assessment process.

Specific tasks will include:

1. update and maintain toxicity testing and chemical analysis databases;
2. develop "look up" table linking toxicity database with the Water Body System database;
3. identify specific watershed and/or river segment location for NPDES facility water sampling stations;
4. modify existing fish toxicity monitoring database to include additional data fields;
5. initiate process of identifying "source" water at municipal sewage treatment facilities; and
6. initiate development and implementation of statewide relational database for environmental monitoring data.

COST: \$17,620

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1996 - 1997

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 96-07/104**

PROJECT TITLE: Bordering Vegetated Wetland Delineation Video

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: The purpose of this project is to produce a video of the Department of Environmental Protection's Bordering Vegetated Wetland delineation method for distribution to conservation commissioners. The video will provide a comprehensive overview of field techniques (including hydric soils, plant identification, and surface hydrology) to guide conservation commissioners through the delineation process. The video will provide the Department with another method to reach commissioners and others who are unable to attend a field session and will provide useful review material for those who have already attended a field training session.

Specific tasks will include:

1. produce and edit a bordering vegetated wetland delineation video; and
2. produce copies and distribute video to conservation commissions.

COST: \$71,000

FUNDING: \$57,000 by the U.S. Environmental Protection Agency  
\$14,000 by the Department of Environmental Protection

DURATION: 1996 - 1998



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 96-08/104**

**PROJECT TITLE:** Development of a Guidance Document for the Construction of Small Docks and Piers

**INVESTIGATOR:** Department of Environmental Protection

**LOCATION:** Statewide

**DESCRIPTION:** The purpose of this project is to develop guidance on design standards for new small dock and pier construction and distribute this information to conservation commissions statewide. The guidance document will cover design specifications, navigation issues, resource protection, and public access. The guidance will also address the revised Chapter 91 regulations for permitting small docks, piers and other structures associated with residential properties in coastal and inland waters. The new local permitting option which is available for these small structures if constructed according to DEP standards will be explained in the guidance document.

Specific tasks will include:

1. develop a guidance manual for small dock and pier construction; and
2. conduct a series of workshops statewide to explain the local permitting option and guidance document to conservation commissioners, lake and pond associations, municipal officials and dock owners.

**COST:** \$100,000

**FUNDING:** \$80,000 by the U.S. Environmental Protection Agency  
\$20,000 by the Department of Environmental Protection

**DURATION:** 1996 - 1998

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 97-01/104**

**PROJECT TITLE:** Stormwater and Nonpoint Source Impacts to Wetlands: Transferring a New Assessment Methodology

**INVESTIGATOR:** Massachusetts Office of Coastal Zone Management

**LOCATION:** North Coastal and Ipswich River Basins

**DESCRIPTION:** This project will apply a recently-developed Wetland Ecological Assessment method to selected wetland study sites in the North Coastal and Ipswich basins by training targeted groups, identifying wetlands adversely impacted by stormwater, and initiating wetland restoration and stormwater mitigation efforts. Methodology will be used by watershed teams and CZM to evaluate Wetland Ecological Integrity.

Specific tasks will include:

1. develop a list of wetland study sites and document associated land uses;
2. conduct wetland field investigations at selected sites;
3. conduct training sessions for watershed associations and basin team members on the field assessment methodology;
4. conduct informational meetings to present results; and
5. prepare final report which summarizes project results.

**COST:** \$61,700

**FUNDING:** \$45,250 by U.S. Environmental Protection Agency  
\$16,450 by the Massachusetts Department of Coastal Zone Management, Essex County Greenbelt, Ipswich River Watershed Association and Salem Sound 2000.

**DURATION:** 1997 - 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 97-02/104**

PROJECT TITLE: Clearwater Estates Revision

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: This project will revise the "Clearwater Estates" development simulation program and guidebook to reflect new regulatory initiatives including the Riverfront Area, 401 Water Quality Certification, Title 5, and stormwater management. New training materials will be developed to assist conservation commissioners with application review, determining jurisdictional areas, performing alternative analysis, and writing effective Orders of Conditions. The new workshop materials will also outline how conservation commissions permitting actions can complement the EOEA watershed approach.

Specific project tasks will include:

1. revise Clearwater Estates guidebook to incorporate new regulatory revisions and performance standards;
2. develop new training materials including figures, maps, sample permit application forms, and sample plans;
3. develop training curriculum to address: application review, jurisdictional areas, site review and alternative analysis, performance standards and mitigation, writing effective Orders of Conditions, other applicable state and federal permits, and Certificates of Compliance;
4. conduct trial sessions for the training curriculum with DEP staff; and
5. print copies of revised Clearwater Estates training materials.

COST: \$112,500

FUNDING: \$90,000 by U.S. Environmental Protection Agency  
\$22,500 by the Massachusetts Department of Environmental Protection

DURATION: 1997 - 1999



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 97-03/104**

PROJECT TITLE: Assessment and Protection of Priority Wetland and Riparian Habitats for State-Listed Reptiles and Amphibians in Massachusetts

INVESTIGATOR: Massachusetts Division of Fisheries and Wildlife

LOCATION: Statewide

DESCRIPTION: This project proposes to gather detailed, site-specific data that will allow more effective protection of riparian and wetland habitats of six species of state-listed freshwater turtles and salamanders, either through regulatory mechanisms or acquisition. Rapid assessment techniques will be used to map and evaluate wetlands and adjacent upland habitats at priority sites and relative abundance and distribution of target species will be documented.

Specific tasks will include:

1. assess and prioritize known occurrences of 6 state-listed turtles and amphibians based on extent, quality and juxtaposition of habitats and their predicted ability to support target species;
2. assess distribution and relative abundance of target species at priority sites and map the types and boundaries of wetlands and uplands that are most likely to comprise the actual habitats of target species;
3. develop a list of priority areas recommended for acquisition; and
4. prepare a final report summarizing project results.

COST: \$43,750

FUNDING: \$35,000 by U.S. Environmental Protection Agency  
\$ 8,750 by the Massachusetts Division of Fisheries and Wildlife

DURATION: 1997 - 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 97-04/104**

PROJECT TITLE: An Assessment of Stormwater Control in the Charles River Watershed

INVESTIGATOR: Charles River Watershed Association

LOCATION: Charles River Basin

DESCRIPTION: This project will gather information on the application of DEP's stormwater management performance standards to the Charles River watershed including costs, and draw general conclusions regarding the projected effect of the implementation of these standards on wetland resources and Charles River water quality.

Specific tasks will include:

1. develop detailed scope of work and workplan for project with the assistance of DEP and CZM staff;
2. collect project data and evaluate effectiveness of stormwater systems; and
3. prepare a final report summarizing project results.

COST: \$55,000

FUNDING: \$50,000 by U.S. Environmental Protection Agency  
\$ 5,000 by the Charles River Watershed Association

DURATION: 1997 - 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 97-05/104**

PROJECT TITLE: Biomonitoring Support for Watershed Management Program

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: This project will provide reconnaissance and biomonitoring support to the Blackstone, Chicopee, Connecticut and Nashua Watershed Teams. The focus of the work will be to determine the percentage of waters that are safe for fishing, swimming and the support of aquatic life and recreation; and the number of freshwater fish consumption advisories.

Specific tasks will include:

1. prepare QAPP for habitat assessment and biomonitoring activities in project watersheds;
2. incorporate biomonitoring results in comprehensive assessment reports;
3. input aquatic life use assessments for surveyed streams; and
4. prepare quarterly reports on project activities.

COST: \$38,769

FUNDING: 100% by U.S. Environmental Protection Agency

DURATION: 1997 - 1999



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 97-06/104**

**PROJECT TITLE:** Development of a GIS Map and Database of the Canoe River Aquifer

**INVESTIGATOR:** Town of Easton

**LOCATION:** Taunton River Basin

**DESCRIPTION:** This project will develop GIS information and conduct an outreach effort to begin an aggressive land acquisition program to protect the Canoe River Aquifer ACEC.

Specific tasks will include:

1. compile and digitize parcels from Assessor's maps in the Canoe River Aquifer for the area on 500 feet on both sides of the mainstem rivers, their main tributaries and within Zone IIs;
2. develop property owner database for identified parcels including owner, assessed value, acreage, location and other relevant information;
3. maintain and update GIS layer's developed for this project;
4. develop informational literature on the importance of the Canoe River Aquifer and distribute this information to property owners; and
5. provide a final project report which describes the activities undertaken and a summary of the results.

**COST:** \$54,000

**FUNDING:** \$38,500 by U.S. Environmental Protection Agency  
\$15,500 by the Town of Easton

**DURATION:** 1997 - 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 97-07/104**

PROJECT TITLE: Hydrologic Model for the Ipswich River Basin

INVESTIGATOR: U.S. Geological Survey

LOCATION: Ipswich River Basin

DESCRIPTION: As a collaborative effort among DEM, DEP and USGS, this project will develop a water management (hydrologic) model to provide a scientific basis for water supply, water quality and aquatic habitat decisions in the Ipswich Basin. A methodology will be developed to couple groundwater and surface water flow. This integrated approach will allow the simulation of predevelopment conditions, current withdrawal conditions, and the prediction of future conditions such as changes in groundwater withdrawals or precipitation.

Specific tasks will include:

1. establish "natural" or baseline flow conditions in River prior to withdrawals;
2. provide data for Water Management Act permitting and safe yield evaluation;
3. account and document current withdrawals;
4. evaluate water supply alternatives;
5. evaluate various instream flow scenarios to determine resource impacts and to calibrate hydrologic model;
6. collect input data for hydrologic model to calculate firm yield to be used in Surface Water Supply permitting for Lynn, Salem/Beverly, Danvers/Middleton and Peabody; and
7. prepare final project report summarizing model results and utilization.

COST: \$300,000

FUNDING: \$75,000 by U.S. Environmental Protection Agency  
\$75,000 by the Massachusetts Department of Environmental Management  
\$150,000 by the U.S. Geological Survey

DURATION: 1997 - 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 97-08/104**

PROJECT TITLE: Salem Sound Nutrient Monitoring

INVESTIGATOR: Massachusetts Division of Marine Fisheries

LOCATION: North Coastal Basin

DESCRIPTION: This project will contribute to a comprehensive marine resource inventory of Salem Sound to collect finfish, invertebrate and water quality data. The DMF will add more water quality sampling sites and tests for additional water quality constituents. Sampling effort will be coordinated with Salem Sound 2000 and DEP's North Coastal Watershed Team.

Specific tasks will include:

1. collect and analyze marine and freshwater water samples for chlorophyll-a, ammonium, nitrate, nitrite, ortho-phosphate, total dissolved nitrogen, total dissolved phosphorous, silicate, particulate nitrogen and particulate carbon;
2. input nutrient data into a database and summarize data; and
3. prepare a final report analyzing marine and freshwater resource information.

COST: \$14,584

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1997 - 1999



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 97-09/104**

PROJECT TITLE: Project on Numeric Biocriteria: Two Unresolved Issues

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: This proposal is designed to address two issues relating to the current Biocriteria Pilot Study; specifically, to evaluate subcoregion difference in stream biota, if any, and formulate the biological indicators (fish and macroinvertebrates) that are essential to assess conditions and monitor changes in streams. Study expects to establish reference streams in 5 of the 13 Massachusetts Ecological Subregions. The study streams are located in the Connecticut, Westfield, Chicopee, Millers and Quinebaug River Basins.

Specific tasks will include:

1. collect and enumerate fish and macroinvertebrate samples in potential reference streams;
2. perform habitat assessments, collect water quality data (temperature, dissolve oxygen, pH, specific conductance and turbidity) and physico-chemical data on potential reference streams; and
3. evaluate and interpret biological data, habitat assessments and stream morphometric data and establish up to 5 reference streams in Ecological Subregions.

COST: \$26,500

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1997 - 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 97-10/104**

PROJECT TITLE: Source Water Protection Project  
INVESTIGATOR: Department of Environmental Protection  
LOCATION: Statewide  
DESCRIPTION: This project will further current efforts for source water protection by providing long-term, comprehensive program that is consistent with new regulatory requirements, other programs and the MWI. The project will also address water suppliers needs for technical assistance and will assist water suppliers develop protection plans.

Specific tasks will include:

1. provide on-site assistance to public surface suppliers and other municipal officials to:
  - a. assist with development and implementation of local protection plans and achieve cost savings offered by EPA;
  - b. address specific local watershed threats with information and recommendations for solutions;
  - c. encourage formation of local watershed committees;
  - d. assist with local vulnerability assessments required by SDWA;
  - e. help suppliers gain support for local measures; and
  - f. integrate newly defined watershed protection Zones A, B, & C into local planning efforts.
2. review draft local protection plans submitted by public surface water suppliers for DEP approval. Determine eligibility for cost-saving disinfection rule credit.
3. promote the enactment of improvements to the Mass. Drinking Water regulations for new land uses within the watersheds of new and expanding public surface water sources;
4. use source protection success stories gathered during prior project work, DWP awards program submittals, sanitary surveys and monitoring waiver applications to develop and distribute collection of brief case studies and contacts to form an in-formal peer assistance network among surface suppliers; evaluate transferability of this project to ground water sources.
5. Prepare a final report.

COST: \$52,267

FUNDING: \$52,267 by the U.S. Environmental Protection Agency

DURATION: 1997 - 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 97-11/104**

PROJECT TITLE: Establishment and Implementation of a Statewide Georeferenced Relational Database System to Manage Environmental Monitoring Data

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: This project will further the development and implementation of a statewide relational database system for environmental monitoring data. Activities will focus on databases for toxicity testing, PALIS, fish contaminant monitoring, water quality data, waterbody system. These databases will directly support the function of the watersheds teams in implementing the 5-yr basin cycle.

Specific tasks will include:

1. update and maintain toxicity testing and chemical analysis results in the Toxicity Testing Database;
2. code all Massachusetts pond, lake, and impoundment polygons in PALIS system to facilitate linkage with GIS;
3. update FCMS with current data;
4. update and maintain Water Quality database for priority watersheds;
5. update and maintain WBS electronic reporting system; and
6. establish georeferences for waterbodies and sampling stations and incorporate in above databases as appropriate.

COST: \$ 30,000

FUNDING: 100% by U.S. the Environmental Protection Agency

DURATION: 1997 - 1999



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 98-01/104**

PROJECT TITLE: Marlborough Easterly WWTF and Hop Brook Diagnostic/Feasibility Study

INVESTIGATOR: Department of Environmental Protection

LOCATION: Concord (SUASCO)

DESCRIPTION: The goal of this project is to provide a comprehensive up-to-date evaluation of the water quality problems in Hop Brook, a subwatershed of the Sudbury River and to evaluate and provide recommendations for in-lake and watershed remediation measures.

Specific tasks will include:

1. a review of all existing data, studies, and recommendations to summarize existing reports and to identify data gaps;
2. preparation of a Quality Assurance Project Plan;
3. collection of water quality samples and stream flow measurements;
4. provide modeling estimates for annual and seasonal nutrient and water budgets;
5. determination of pond contours and sediment depth profiles;
6. determination of factors which influence Hydrodictyon growth;
7. completion of algal, fish, zooplankton, and aquatic macrophyte surveys;
8. a watershed survey to determine non-point sources of pollution;
9. an evaluation of various alternatives to reduce nutrient loading and algal growth; and
10. completion of a final report summarizing project activities.

COST: \$ 90,000

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1998- 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 98-02/104**

PROJECT TITLE: TMDL Modeling for Priority Basins

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: This project will provide technical support to the DEP watershed teams through mathematical modeling efforts including the Bureau of Resource Protection's Modeling Tool Kit, DEP's nitrogen loading model, NO3NLM, QUAL2EL, SWMM, and HSPF.

Specific tasks will include:

1. the application and maintenance of these and other water and land based models;
2. provide recommendations on the type and quantity of data necessary to effectively utilize water supply and wastewater models;
3. preparation of reports on water quality, hydrology and pollutant transport, developing and maintaining programs to track environmental data, and the development of total maximum daily loads (TMDLs) and waste load allocations.

COST: \$ 65,200

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1998 - 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 98-03/104**

PROJECT TITLE: Smart Monitoring: Building Monitoring Capacity for EOEa Watershed Teams

INVESTIGATOR: Department of Environmental Protection

LOCATION: Nashua River Watershed

DESCRIPTION: This project will use the Nashua River Watershed for a demonstration of "SMART" monitoring. SMART monitoring (Strategic Monitoring for River Basin Teams) is a collection of low cost and no-cost methods for building the capacity of EOEa Watershed Teams for water quality monitoring.

Specific objectives include:

1. develop a comprehensive monitoring plan for Nashua River Watershed,
2. better integrate monitoring data into the EOEa Watershed Initiative,
3. and augment DEP's DWM monitoring efforts through better use of DEP staff and student interns.

COST: \$ 54,000

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1998 - 2000



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 98-04/104**

PROJECT TITLE: Prioritizing Stormwater Enforcement Efforts; A Multi-Watershed Study

INVESTIGATOR: Department of Environmental Protection

LOCATION: Charles, Merrimack and Neponset River Watersheds

DESCRIPTION: Stormwater is believed to be the most significant cause of water quality standard violations. In this study, stormwater will be sampled and analyzed for Fecal coliform and total coliform as well as four other indicators ( E. Coli, enterococci, clostridium perfringens and coliphages) in three watersheds; Charles, Merrimack and Neponset. The four indicators will be used to confirm that the source of high fecal coliform levels is not plant or soil related.

This study will:

1. include sampling in multiple watersheds during wet weather events during three different seasons.
2. provide information to help DEP prioritize stormwater assessment and remediation efforts to maximize public health benefits.

COST: \$ 45,015

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1998 - 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 98-05/104**

**PROJECT TITLE:** Quality Assurance Project Plan Support for Lake, River, and Coastal Water Monitoring

**INVESTIGATOR:** University of Massachusetts-Amherst

**LOCATION:** Statewide

**DESCRIPTION:** This demonstration project will assist non-government organizations (NGOs) to write Quality Assurance Project Plans (QAPPs) for water monitoring programs conducted within the framework of the Massachusetts Watershed Initiative (MWI). The MWI envisions collaborative efforts by EOEA Basin Teams and NGOs to conduct watershed assessments that investigate issues of importance to local decision makers as well as provide information of use to the EOEA Teams.

Specific tasks will include:

1. compile a library of existing QAPPs and relevant Standard Operating Procedures (SOPs) for three types of surveys: basic River Monitoring, Lake Monitoring, and Coastal Monitoring will be established. These will be modified as necessary to serve as template QAPPs.
2. develop a guidebook using the templates to write issue and site specific QAPPs
3. conduct three workshops and provide additional assistance on writing QAPPs will be provided to monitoring groups in the Deerfield, Millers, Ipswich and Buzzards Bay basins (the "Blue Basins).
4. by working with the Basin Teams and monitoring groups in these basins, this project will help the NGOs produce at least 5 QAPPs for programs consistent with the goals of the MWI.

**COST:** \$ 60,000

**FUNDING:** \$40,000 by the U.S. Environmental Protection Agency 104(b)(3)  
\$20,000 by the U.S. Environmental Protection Agency 319

**DURATION:** 1998 - 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 98-06/104**

PROJECT TITLE: Development of Protocols for Detecting Significant Impacts to Macroinvertebrate Communities in Wadable Streams

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: This project will develop Standard Operating Procedures (SOP) to detect and characterize significant impacts to freshwater macroinvertebrate communities. SOPs developed will augment the ability of Watershed Teams to protect and enhance inland waters by providing a tool that is free from the limitations of chemical or toxicological testing.

Specific tasks will include:

1. literature review of field and laboratory protocols;
2. an analysis of large-scale databases to develop analytical protocols;
3. provide recommendations on analytical protocols for data analysis;
4. recommended reporting protocols including description of database structures;
5. recommended criteria for determining impact and degree of impact;
6. recommended software for entering, compiling and analyzing data;
7. five training sessions for Department staff on the theory and use of the recommended protocols and analytical techniques; and
8. final project report summarizing project activities.

COST: \$ 83,500

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1998 - 2000



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 98-07/104**

PROJECT TITLE: Assessment of Stormwater Control in the Charles River Basin -Phase II

INVESTIGATOR: Charles River Watershed Association

LOCATION: Charles River Basin

DESCRIPTION: This project is a continuation of work funded under a FFY97 104(b)(3) grant. This phase of the project will consist of additional wet-weather sampling of stormwater BMPs and completion of a final project report. The final report will provide information on the application of DEP's stormwater performance standards to the Charles River watershed including costs, and draw general conclusions regarding the projected effect of the implementation of these standards on wetland resources and Charles River water quality.

COST: \$ 17,658

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1998 - 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 98-08/104**

**PROJECT TITLE:** Continuation of the Assessment and Protection of Priority Wetland and Riparian Habitats for State-listed Reptiles and Amphibians in Massachusetts

**INVESTIGATOR:** Division of Fisheries and Wildlife

**LOCATION:** Statewide

**DESCRIPTION:** This project is a continuation of work funded under a FFY97 104(b)(3) grant. Project effort is statewide with a focus on Parker, Merrimack, Quinebaug, French, Deerfield, Millers, Buzzards Bay and Ipswich River Basins. Detailed, site-specific data will be gathered for an additional two years.

The project objectives will be to:

1. map and characterize the wetland and riparian habitats of six species of state-protected rare amphibians and reptiles. This data will allow more effective protection of riparian and wetland habitats of state-listed freshwater turtles and salamanders, either through regulatory mechanisms or acquisition.
2. Protection plans will be prepared for priority sites that describe essential habitats, local distributions of rare species, and conditions that would adversely affect these habitats.
3. Provide habitat assessment information and technical support including guidance on wildlife habitat assessment methods to watershed teams and DEP.

**COST:** \$117, 829

**FUNDING:** 100% by the U.S. Environmental Protection Agency

**DURATION:** 1998 - 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 98-09/104**

PROJECT TITLE: Wetlands Data Development and Distribution to Conservation Commissions and Watershed Teams.

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: The Wetlands Conservancy Program will produce and distribute detailed maps (1:5,000 scale digital orthophotoquads -DOQs) to Conservation Commissions, DEP Regional and Boston Offices, and EOEA Watershed Teams.

Specific tasks will include:

1. complete production of accurate digital wetland information compiled onto DOQ base maps for approximately 50% of the state;
2. develop a series of standard maps for displaying this wetland data on the DOQ base map; and
3. produce and distribute copies of these standard maps.

COST: \$100,334

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1998 - 2000



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 98-10/104**

**PROJECT TITLE:** Connecticut River Land Use and Nutrient Study

**INVESTIGATOR:** U.S. Geological Survey

**LOCATION:** Connecticut River Basin

**DESCRIPTION:** This project will collect water quality and hydrologic data from selected sub-basins with uniform land use in the Connecticut River Basin. These data will be used to refine nutrient loadings expected from selected land uses.

The information generated from this study will assist the Department better identify nutrient sources and prioritize those for mitigation.

Specific tasks will include:

1. determine the best estimates for nutrient export coefficients from three small watersheds with uniform land use (forested, agricultural, urban types);
2. describe if the relationship between nutrient concentrations are related to flow; and
3. estimate what portion of nutrient loading that reaches the stream is from atmospheric deposition.

**COST:** \$30,500

**FUNDING:** \$20,000 by the U.S. Environmental Protection Agency  
\$10,500 by the U.S. Geological Survey

**DURATION:** 1998-1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(B)(3) PROJECT 98-11/104**

PROJECT TITLE: Support for Development and Implementation of Total Maximum Daily Load (TMDL's)

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: This project will support and assist the Department's efforts to develop and implement the Total Maximum Daily Load (TMDL) Program in Massachusetts. TMDL's will be developed based on the Department's TMDL strategy.

The work is a necessary component of the Massachusetts Watershed Initiative and will result in the implementation of corrective measures to address water quality degradation.

Specific tasks will include:

1. defining necessary protocols and analytical methods for determining TMDL's and developing TMDL's for submittal to EPA for approval;
2. assisting in the development of analytical approaches and strategies for the control of point and nonpoint source pollution; and
3. directing public involvement and outreach activities to present TMDL findings to gain public support for implementation.

COST: \$85,000

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1998-1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 99-01/104**

PROJECT TITLE: TMDL Modeling for Priority Basins

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide

DESCRIPTION: This project will provide technical support to the DEP watershed teams through mathematical modeling efforts including the Bureau of Resource Protection's Modeling Tool Kit, DEP's nitrogen loading model, NO3NLM, QUAL2EL, SWMM, and HSPF.

Specific tasks will include:

1. the application and maintenance of these and other water and land based models;
2. provide recommendations on the type and quantity of data necessary to effectively utilize water supply and wastewater models;
3. preparation of reports on water quality, hydrology and pollutant transport, developing and maintaining programs to track environmental data, and the development of total maximum daily loads (TMDLs) and waste load allocations.

COST: \$ 65,200

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1999 - 2001



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 99-02/104**

PROJECT TITLE:                      Biomonitoring Support for Watershed Management Program

INVESTIGATOR:                      Department of Environmental Protection

LOCATION:                              Statewide

DESCRIPTION:                      This project will provide reconnaissance and freshwater biomonitoring support, as needed, to watershed teams during year 2 of the river basin schedule including the Merrimack, Parker, French and Quinebaug, Boston Harbor, Narragansett, and Cape Cod teams. Biomonitoring activities may include Rapid Bioassessment Protocols (RBP) for macroinvertebrate or fish populations, fish toxics monitoring, primary production studies, or other efforts aimed at assessing aquatic life use support. Habitat assessment and biomonitoring functions will be carried out according to the terms of the respective project plans. Results will be presented to the watershed teams in the form of technical memoranda, or incorporated into comprehensive assessment reports, as dictated by the magnitude and extent of other monitoring and assessment activities that may have been performed. Assessments will be used to focus "individual control strategies" (ICS) in the form of wastewater discharge or other necessary permits, and implementation of best management practices (BMP) for controlling nonpoint pollution. Aquatic life use assessments will be stored in the Waterbody System database for future reference by watershed teams, and for generating state-wide reports to EPA as required by sections 305(b) and 303(d) of the Clean Water Act.

COST:                                  \$46,100

FUNDING:                              100% by the U.S. Environmental Protection Agency

DURATION:                              1999 – 2001

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 99-03/104**

**PROJECT TITLE:** Outreach to Promote the TMDL Strategy

**INVESTIGATOR:** Department of Environmental Protection

**LOCATION:** Statewide

**DESCRIPTION:** The goal of this project is to develop a series of outreach and education documents that incorporate the total maximum daily loads (TMDL) strategy. Emphasizing skill development and knowledge transfer, outreach materials will be prepared for use by EOE/DEP watershed teams, circuit riders, municipal assistance outreach programs, and lake associations.

Specific tasks will include:

1. adapt a watershed survey document developed by the State of Maine for use in Massachusetts. The survey document will provide guidance to lake associations and watershed teams on locating, identifying, and controlling sources of pollution;
2. develop a TMDL fact sheet to explain the TMDL process and what this means to watershed residents;
3. update DEP brochures such as "Fertilizers and your Lake" and "Septic Systems and your Lake"; and
4. coordinate postings of Division of Watershed Management's documents on the Department's Watershed Web page.

**COST:** \$ 44,728

**FUNDING:** 100% by the U.S. Environmental Protection Agency

**DURATION:** 1999 - 2001

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 99-04/104**

PROJECT TITLE:	Simulation-Optimization groundwater modeling of the Upper Charles River Basin
INVESTIGATOR:	U.S. Geological Survey
LOCATION:	Charles River Basin
DESCRIPTION:	<p>The USGS in cooperation with MADEM and the CRWA is currently investigating groundwater resources within the Upper Charles River Watershed. The watershed consists of several disconnected stratified-drift aquifers that constitute important local water supplies. Rapid development in the Basin has brought a number of water resource issues to the fore and made it necessary to develop regional hydrologic tools to evaluate groundwater resources in the basin.</p> <p>This project proposes to include the Jar/Dropping/Bogastow aquifer into the ongoing USGS Study. With the inclusion of the this aquifer system into the upper Charles groundwater model a more complete and integrated evaluation of the upper basin will be obtained.</p>
COST:	\$71,080
FUNDING:	100% by U.S. Environmental Protection Agency
DURATION:	1999 - 2001



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 99-06/104**

PROJECT TITLE: Lake Surveys for TMDL Development

INVESTIGATOR: Division of Fisheries and Wildlife

LOCATION: Statewide

DESCRIPTION: The objective for this statewide study is to provide a database for lakes listed as impaired on the 303d list. Data such as secchi, bathymetry, nutrients, aquatic plant species composition and plant coverage will be compiled to determine optimal plant coverage for fisheries. Additionally, the Division will provide technical assistance and transfer of fisheries data to government agencies and private organizations involved in watershed management and assist in the development of volunteer and watershed participant action plans.

FUNDING: 100 % by the U.S. Environmental Protection Agency

COST: \$84,880

DURATION: 1999 – 2001

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 99-07/104**

**PROJECT TITLE:** Identifying Sources of Microbiological Contamination of Freshwater Beaches

**INVESTIGATOR:** Department of Environmental Protection

**LOCATION:** Parker, Ipswich and Charles Basins

**DESCRIPTION:** Numerous beaches in the Commonwealth are closed to swimming periodically due to microbiological contamination. This project would field test a cooperative approach involving DEP, local officials and local basin watershed associations to identify sources of bacterial contamination at freshwater beaches by sampling dry and wet weather discharges from stormwater outfalls. It will also involve using techniques such as comparing gutter sampling results versus outfall results to evaluate the contribution of microbiological contamination from illicit sewage connections versus contamination from street runoff.

Specific tasks will include:

1. support the joint DEP Boston office-NERO ongoing effort to develop a municipal stormwater strategy by developing valuable data about the impacts of stormwater on high priority areas (recreational bathing beaches) and by field testing an approach to source identification and remediation.
2. evaluate the fecal coliform removal efficiency of gross particle separators installed in storm drains.
3. compare the levels measured with the new 24 hour EPA proposed Method 1600 Enterococcus test with the results from the standard 48 hour Enterococcus test.

**COST:** \$30,000

**FUNDING:** \$30,000 by the U.S. Environmental Protection Agency

**DURATION:** 1999 – 2001

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 99-08/104**

**PROJECT TITLE:** Balancing Mosquito Control and Wetlands Impacts: Assessment, Policy Analysis, and Best Management Practices

**INVESTIGATOR:** University of Massachusetts-Amherst

**LOCATION:** Statewide

**DESCRIPTION:** The goal of this project is to reduce point and non-point discharges to surface water and reduce wetlands loss resulting from source reduction projects undertaken by mosquito control districts. However, the extent of these impacts is unknown and these mosquito control activities are exempt from the MA Wetlands Protection Act. Recognizing the public benefits of mosquito control programs, there is also a need to reduce any unnecessary impacts to wetland systems by these activities. This may best be achieved through development and implementation of standard operating procedures and best management practices for mosquito control projects.

**COST:** \$119,613

**FUNDING:** \$84,887 by the U.S. Environmental Protection Agency  
\$34,726 by University of Massachusetts

**DURATION:** 1999 - 2001



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 104(b)(3) PROJECT 99-09/104**

**PROJECT TITLE:** Wetlands Compliance and Enforcement Strategy Development

**INVESTIGATOR:** Department of Environmental Protection

**LOCATION:** Statewide

**DESCRIPTION:** The Department will develop new compliance and enforcement strategies, tools, and techniques that will encompass recent changes and additions to the Wetlands Program, such as the protection of riverfront areas, development of stormwater management standards, and regionalization of the 401 water quality certification program. This project will also provide support and guidance to Department staff and conservation commissions as they begin enforcing these new program elements.

Specific tasks will include:

1. review existing legal authorities and enforcement documents provided by the Wetlands Program, and develop a comprehensive compliance and enforcement strategy that incorporates all program elements, including riverfront protection, stormwater management, and 401 water quality certification;
2. develop specific compliance and enforcement tools for incorporation into the ERG, such as penalty "bucket sheets" for each program element;
4. update or develop model documents for conservation commissions and DEP staff to use in conducting enforcement, such as Enforcement Orders, Notices of Noncompliance, Expans, Pans, and Administrative Consent Orders;
5. update the "Enforcement Manual for Wetlands Protection in Massachusetts";
6. produce a summary version of the Enforcement Manual, (i.e. a "Quick Guide to Enforcement,") and produce this document in alternative formats such as publication on the Department's Web Page; and
7. plan, coordinate, and conduct workshops for Wetlands staff, conservation commissions and municipal officials.

**COST:** \$133,300

**FUNDING:** \$100,000 by the U.S. Environmental Protection Agency  
\$33,300 by DEP Wetlands Program

**DURATION:** 1999 - 2001

## **Section II. 604b: Water Quality Management Planning FFY96 to FFY**

### **MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION SECTION 604b Water Quality Planning Program Project 96-01/604**

**PROJECT TITLE:** Hoosic River NPS Pollution Assessment Project

**INVESTIGATOR:** Berkshire Conservation District

**LOCATION:** Hoosic River Watershed

**DESCRIPTION:** This project will provide a comprehensive environmental/land use assessment of the entire Hoosic River Watershed. Based on the assessment information, recommendations will be developed to address existing nonpoint source problems and to prevent future nonpoint source pollution in the watershed. The primary goal of the project is to establish a solid information base to guide future governmental and private property actions to minimize nonpoint source pollution and ensure a high level of water quality in the Hoosic River Watershed.

Specific tasks will include:

1. acquire and update existing GIS data, and develop new GIS data layers relevant to the various physical, institutional, and natural features of the watershed;
2. develop a land suitability map that will illustrate general environmental constraints to development in the watershed;
3. determine the type, intensity and distribution of existing land uses within the watershed;
4. assess and identify potential and existing sources of pollution;
5. organize and conduct a "Stream Team" survey on the North Branch;
5. evaluate and model selected pollutant loadings in the watershed;
7. assess local water quality protection measures and regional and local environmental awareness and needs for public education and technical assistance; and
8. develop a watershed action plan.

**COST:** \$66,730

**FUNDING:** \$59,830 by the U.S. Environmental Protection Agency  
\$6,900 by the Berkshire Conservation District, the Berkshire County Regional Planning Commission, the Natural Resource Conservation Service and the University of Massachusetts.

**DURATION:** 1996-1998

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 604b Water Quality Planning Program Project 96-02**

PROJECT TITLE: Assessment of On-Site Sewage Disposal Related Pollution in Gloucester Waters

INVESTIGATOR: Gloucester Board of Health

LOCATION: North Coastal Basin

DESCRIPTION: This project will assess existing and new data relative to fecal coliform pollution from failing septic systems in the City of Gloucester's water resources, particularly those impacting shellfish beds. The project will provide a rapid assessment of the extent and location of septic system pollution problems to efficiently focus cleanup efforts and provide a baseline for comparison to post-cleanup water quality.

Specific tasks will include:

1. analyses historic water quality data to determine which shellfish beds have been commonly impacted by fecal coliform pollution;
2. assess the degree to which historic fecal coliform pollution is attributable to inadequately treated septic system effluent;
3. collect and analyze water quality samples not historically monitored for septic system pollution;
4. identify upland areas likely to have significant septic system problems using GIS; and
5. involve resident and shellfish stakeholders in project's conclusions by way of presentations and neighborhood meetings.

COST: \$49,536

FUNDING: \$41,396 by the U.S. Environmental Protection Agency  
\$8,140 by the City of Gloucester and the Massachusetts Division of Marine Fisheries

DURATION: 1996-1998



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 604b Water Quality Planning Program Project 96-03**

**PROJECT TITLE:** An Assessment of Urban Stream Restoration: Tannery and Poor Brooks

**INVESTIGATOR:** Pioneer Valley Planning Commission

**LOCATION:** Connecticut and Chicopee River Watersheds

**DESCRIPTION:** The project objective is to identify potential watershed management practices that will restore water quality in Tannery and Poor Brooks, two degraded urban streams, to a more natural condition. The project will utilize a comprehensive watershed management approach to assess measures that address stormwater runoff, erosion and sedimentation, wetland degradation, and flooding by using restoration and stormwater control measures.

Specific tasks will include:

1. establish watershed committees for each brook;
2. conduct a sampling program to identify existing watershed conditions within each watershed;
3. develop GIS maps of the watersheds;
4. perform an analysis of the watersheds based on sampling and mapping task results and develop a matrix of watershed management practices for restoration;
5. conduct public outreach to promote awareness of the project including a public forum on recommended restoration actions; and
6. develop an implementation plan for restoration of the watersheds with recommended actions and guidance for future outreach activities.

**COST:** \$83,380

**FUNDING:** \$45,880 by the U.S. Environmental Protection Agency  
\$37,500 by the Natural Resource Conservation Service, City of Holyoke, City of Springfield, and local volunteers.

**DURATION:** 1996-1998

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 604b Water Quality Planning Program Project 96-04/604**

**PROJECT TITLE:** Edgartown Great Pond: Existing and Projected Nitrogen Loading

**INVESTIGATOR:** Martha's Vineyard Commission

**LOCATION:** Islands Watershed

**DESCRIPTION:** This project will provide delineation of critical areas of the groundwatershed of Edgartown Great Pond on Martha's Vineyard. Land-use analysis and nitrogen loading modeling will be performed to examine build-out scenarios and the resultant potential impacts to the pond. Public outreach will be ongoing throughout the project to inform and involve watershed stakeholders and residents in the development of long and short term pond watershed management strategies.

Specific tasks will include:

1. delineate the groundwater watershed of the pond and perform an assessment of pond recharge rates and groundwater flows;
2. map existing and projected land use of the groundwater recharge area and model nitrogen loading for three growth scenarios;
3. determine a nitrogen loading limit for the pond;
4. provide a matrix of watershed management strategies for the pond and present two comprehensive management scenarios for water quality improvement/preservation for public consideration; and
5. provide public education via the press and public meetings to promote awareness of the project.

**COST:** \$44,954

**FUNDING:** \$33,454 by the U.S. Environmental Protection Agency  
\$11,500 by the Martha's Vineyard Commission

**DURATION:** 1996-1998

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 604b Water Quality Planning Program Project 96-05/604**

PROJECT TITLE: Housatonic River Watershed Nonpoint Source Pollution Assessment Project

INVESTIGATOR: Berkshire Regional Planning Commission

LOCATION: Housatonic River Basin

DESCRIPTION: The Housatonic River Watershed nonpoint source pollution assessment project will comprehensively assess both existing and potential water quality problems within the watershed. The primary goal of this project is to establish a solid information base to guide future governmental and private property actions to minimize nonpoint source pollution and ensure a high level of water quality in the Housatonic River Watershed.

Specific tasks will include:

1. conduct a comprehensive environmental/land use assessment of the basin that will inventory its various physical and institutional characteristics and natural features;
2. identify existing and potential nonpoint source pollution problems;
3. update existing GIS data relevant to the watershed and develop new GIS data layers based on the information collected under tasks 1 and 2;
4. assess the local capacity to address nonpoint source pollution impacts by analyzing existing municipal bylaws and other source controls; recommendations on how to more comprehensively address nonpoint source pollution will be developed based on this assessment; and
5. develop a Watershed Action Plan which presents a comprehensive management strategy to address the remediation of existing nonpoint source pollution problems and prevention of future nonpoint source pollution.

COST: \$60,000

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1997-1998



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**SECTION 604b Water Quality Planning Program Project 96-06/604**

**PROJECT TITLE:** Assessment and Evaluation of Stormwater Source Reduction Practices on Combined Sewer Overflows

**INVESTIGATOR:** Pioneer Valley Planning Commission

**LOCATION:** Connecticut Watershed

**DESCRIPTION:** The project will assess the potential impacts of stormwater source reduction projects on a specified CSO outfall point. Focusing on a single sewershed or sub-sewershed, it will use a hydraulic model to predict the likelihood of CSO events under different stormwater reduction scenarios. The modeling results will then be analyzed to determine the extent to which stormwater best management practices (BMP's) can achieve significant reductions in CSO volume and frequency, and to develop a recommended stormwater management plan for the study area. Comparative cost estimates will be used to evaluate the relative advantages and disadvantages of a source reduction approach to CSO abatement, and to develop the recommended stormwater management plan.

Specific tasks will include:

1. establish a project Steering Committee;
2. collect data to identify and characterize existing conditions in the study area;
3. develop Geographic Information Systems (GIS) maps of the conditions identified in Task 2;
4. develop a baseline model of CSO frequency and flow for 10-12 classifications of storm event;
5. develop a set of stormwater reduction scenarios for the study area;
6. for each of the stormwater BMP's identified in Task 5, predict the impacts on CSO frequency and flow using the SWMM hydraulic model; and identify the most promising stormwater reduction scenarios identified by the modeling in Task 6 and prepare a comparative cost analysis of them.

**COST:** \$34,700

**FUNDING:** 100% by the US Environmental Protection Agency

**DURATION:** 1997-1998

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 604b Water Quality Planning Program Project 97-01/604**

**PROJECT TITLE:** Stream Classification and Assessment Project

**INVESTIGATOR:** Franklin County Council of Governments

**LOCATION:** Connecticut and Deerfield Watersheds

**DESCRIPTION:** This project proposes to use the Rosgen Stream Classification and Assessment Methodology to generally classify and assess stream types in the Deerfield and Connecticut River Basins, to collect data at selected sites on different stream types, and to establish an inventory of different stream types for reference and educational purposes. The resulting information will be used to make predictions about stream behavior, anticipate problems in the watershed as a result of certain land uses, identify areas in need of restoration, distinguish between natural stream migration and evidence of stream instability, and improve overall ability to make good watershed planning decisions based on the stability and types of streams in the watershed. The primary purpose of the work is to develop and disseminate a reference base of information that can be used to educate local boards and others about the different characteristics of stream types and the usefulness of the stream classification system, provide actual local reference sites for hands-on training, and develop tools for local planning and development decision-making.

**COST:** \$52,500

**FUNDING:** 100% by the U.S. Environmental Protection Agency

**DURATION:** 1997-1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**SECTION 604b Water Quality Planning Program Project 97-01/604**

PROJECT TITLE: Priority Land Acquisition Assessment for Cape Cod: Protecting Suitable Land for Future Water Supply Needs

INVESTIGATOR: Cape Cod Commission

LOCATION: Cape Cod Watershed

DESCRIPTION: This project proposes to conduct a regional assessment of suitable parcels for potential water supply sites and water supply source protection in the Cape Cod Watershed. The method proposed will serve as a rational, cost effective planning tool for identifying potential future well sites and guidance for parcel acquisition. The project will consist of the development and application of an innovative parcel-based GIS methodology to refine efforts to identify priority water supply related land parcels for immediate protection and eventual acquisition. Prioritization of parcels will be conducted cooperatively with water supply purveyors and town planners.

COST: \$36,300

FUNDING: 100% by the U.S. Environmental Protection Agency

DURATION: 1997-1999



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**SECTION 604b Water Quality Planning Program Project 98-01/604**

PROJECT TITLE: Urban Watershed Management in the Mystic River Basin

INVESTIGATOR: Metropolitan Area Planning Council

LOCATION: Boston Harbor (Mystic)

DESCRIPTION: The project will provide recommendations for reducing pollutant runoff into Spy Pond based on a detailed analysis of land cover in watershed. Baseline water quality information, data gaps, and nonpoint source pollution issues will be identified in the Horn Pond watershed. Dry and wet weather water quality sampling will be conducted in Horn Pond watershed. A detailed assessment of the drainage area that contributes runoff for the one large stormwater outfall in Horn Pond will be conducted. Recommendations will be provided to improve stormwater management in the Horn Pond watershed including opportunities for stormwater remediation and future grant funding.

COST: \$49,820

FUNDING: \$42,343 – by the U.S. Environmental Protection Agency  
\$ 7,477 – by the Metropolitan Area Planning Council

DURATION: 1998 - 2000



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**SECTION 604b Water Quality Planning Program Project 98-02/604**

**PROJECT TITLE:** Parker River Basin: Assessment and Management of Nonpoint Source Pollution in the Little River Subwatershed

**INVESTIGATOR:** Merrimack Valley Planning Commission

**LOCATION:** Parker River Basin

**DESCRIPTION:** This project will comprehensively inventory, map, and assess nonpoint sources of pollution in the Little River subwatershed of the Parker River Basin.

Specific tasks will include:

1. production of parcel-based GIS maps and databases of an use and nonpoint pollution sources through research of local and state records and intensive field surveys;
2. water quality sampling to identify fecal coliform bacteria sources and loadings in the Little River mainstem and tributaries;
3. review and evaluation of local nonpoint source control measures;
4. development of management recommendations for enhancing Little River water quality.

**COST:** \$62,420

**FUNDING:** \$54,930 by the U.S. Environmental Protection Agency  
\$ 7,500 by the Merrimack Valley Planning Commission

**DURATION:** 1998 - 2000



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**SECTION 604b Water Quality Planning Program Project 98-03/604**

**PROJECT TITLE:** Upper Blackstone River Watershed Wetlands Restoration Plan

**INVESTIGATOR:** Worcester County Conservation District

**LOCATION:** Blackstone River Basin

**DESCRIPTION:** The project involves preparation of an upper Blackstone River Watershed Wetlands Restoration Plan that complies with the technical and planning criteria of the Massachusetts Wetlands Restoration & Banking Program. This includes: updating wetlands map data; identifying, characterizing and mapping potential wetlands restoration sites; establishing a digital wetlands database; evaluating how wetlands restoration can help improve the watershed in terms of water quality, flood storage, fish habitat, and wildlife habitat. The project will be carried out by the Worcester County Conservation District in cooperation with the WRBP and UMASS Amherst

**COST:** \$69,489

**FUNDING:** \$49,789 by the U.S. Environmental Protection Agency  
\$19,700 by the Wetland Restoration and Banking Program

**DURATION:** 1998 - 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 604b Water Quality Planning Program Project 98-04/604**

PROJECT TITLE: Assessment of current Quality and projected nutrient loading: Menemsha Pond and Chilmark Great Pond.

INVESTIGATOR: Martha's Vineyard Commission

LOCATION: Island Watershed

DESCRIPTION: This project will assess the water quality and determine the nutrient loading limits for Menemsha Pond and Chilmark great Pond.

Specific tasks will include:

1. determine sources of bacterial contamination and assess nutrient status in Chilmark Great Pond using both existing and new water quality data;
2. determine nitrogen loading to Chilmark Great Pond and Menemsha Pond;
3. determine flushing time and estimate nitrogen loading limit for Chilmark Great Pond and Menemsha Pond;
4. determine project buildout loading and assess impact on Ponds; and
5. recommend options to reduce nitrogen loads (as needed) by bylaw revisions, easement acquisitions, and pond opening cycles.

COST: \$45,415

FUNDING: \$37,670 by the U.S. Environmental Protection Agency  
\$ 7,745 by the Martha's Vineyard Commission

DURATION: 1998 - 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 604b PROJECT 99-01/604**

PROJET TITLE: Priority Land Acquisition Assessment for Cape Cod: Phase 2

INVESTIGATOR: Cape Cod Commission

LOCATION: Cape Cod

DESCRIPTION: This project is the second phase of a priority land rating project initiated under a previous 604b grant. This phase of the project will provide guidance to eleven Cape Cod towns towards securing new land for water supply. Project tasks will include providing detailed GIS maps of the most suitable parcels for potential acquisition. These GIS maps will provide surficial topography and depth to water table information. A detailed analysis of relevant water development factors including funding options, groundwater protection measures, withdrawal permitting issues, and identification of local concerns affecting site selection will be prepared for each recommended site. A series of Public meetings will be conducted to distribute project information.

COST: \$49,900

FUNDING: \$49,900 by the U.S. Environmental Protection Agency

DURATION: 1999 – 2001

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 604b PROJECT 99-02/604**

PROJECT TITLE: Nutrient Loading to two Great Ponds: Tisbury Great Pond and Lagoon Pond

INVESTIGATOR: Martha's Vineyard Commission

LOCATION: Islands Watershed

DESCRIPTION: Martha's Vineyard Commission will assess water quality in both Tisbury Great Pond and Lagoon Pond using existing water quality data and by acquiring new data. Groundwater watershed contribution boundaries, flushing times, existing and potential land uses, buildout nutrient loads and acceptable load limits will be determined for each pond. Options to meet loading limits including land purchase, easements, zoning changes, performance standards and sewage treatment options will be prepared for both ponds.

COST: \$52,000

FUNDING: \$50,000 by the U.S. Environmental Protection Agency  
\$ 2,000 by the Martha's Vineyard Commission

DURATION: 1999 – 2001



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 604b PROJECT 99-03/604**

PROJECT TITLE: Cape Cod Coastal Nitrogen Loading Studies

INVESTIGATOR: Cape Cod Commission

LOCATION: Cape Cod

DESCRIPTION: The Cape Cod Commission will complete the nitrogen loading assessments for three embayments – Centerville River, Nauset Marsh and Town Cove; and Herring River systems initiated under previous grants. Development of nitrogen limits/TMDLs, determination of nitrogen loads, and recommendations for potential pollution controls will be prepared. In addition, recent water quality and revised tidal flushing in the Popponesset Bay system, including the Mashpee River, will be used to produce nitrogen management options for this system.

COST: \$45,000

FUNDING: \$45,000 by the U.S. Environmental Protection Agency

DURATION: 1999 – 2001

### Section III. 319(h): Nonpoint Source Projects FFY96 to FFY00

#### MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION SECTION 319 NPS PROJECT 96-01/319

PROJECT TITLE: Septic System Management 2000 Project

NPS CATEGORY: Land Disposal

INVESTIGATOR: University of Massachusetts, Amherst

LOCATION: Statewide Massachusetts

DESCRIPTION: A septic system information database was developed and demonstrated under the S.319 project 93-11, Wachusett Septic System Management Program. Project 96-01 will build on 93-11 by offering statewide assistance to any Board of Health wanting to implement the computer program, and by specifically implementing the computer program in 20 municipalities in the French and Quinebaug, Neponset and Cape Cod Basins. This project will provide the needed assistance to Boards of Health for establishing routine procedures for ongoing monitoring of septic systems.

Specific tasks will include:

1. distribute information regarding the use and application of the program to all municipalities that are listed as having any percentage of non-sewered areas; follow-up requests for assistance by holding regional hands-on training workshops and establishing a phone-consultation system;
2. translate the Lotus 123 program into dbase application, and produce copies of the software and user manuals for distribution to all interested communities;
3. conduct hands-on training workshops in the French and Quinebaug, Neponset and Cape Cod Basins, and provide to the Boards of Health in these basins the information and technical assistance needed to implement the computer program; and
4. monitor the application and use of the computer program, and adapt the program as necessary based on input from the Boards of Health.

COST: \$123,310

FUNDING: \$73,818 by the U.S. Environmental Protection Agency  
\$40,800 by 20 Massachusetts Municipalities  
\$8,692 by the University of Massachusetts Cooperative Extension

DURATION: 1996 - 1997

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 96-02/319**

PROJECT TITLE: Monitoring Strategies for Innovative On-Site Sewage Disposal Technologies

NPS CATEGORY: Land Disposal

INVESTIGATOR: University of Massachusetts- Amherst and Lowell

LOCATION: Statewide Massachusetts

DESCRIPTION: The purpose of this project is to demonstrate the proper use of innovative on-site sewage disposal technologies by providing guidelines for the engineering, regulation, performance and monitoring of these systems. Sampling of selected systems will also be conducted to obtain long term monitoring data needed to evaluate these systems.

Specific tasks will include:

1. monitor selected innovative technologies and use the data to evaluate the performance of each system and determine its operational limitations; prepare a separate report which presents the monitoring results and publish this report as a Massachusetts Agricultural Experiment Station bulletin to ensure widespread distribution; and
2. prepare a manual which details the conceptual design, performance, advantages and limitations of innovative on-site sewage disposal technologies and provide copies of this manual to each municipal Board of Health in Massachusetts. Results of the monitoring conducted under Task 1 will be included in the manual.

COST: \$92,842

FUNDING: \$54,944 by the U.S. Environmental Protection Agency  
\$37,898 by the University of Massachusetts Cooperative Extension

DURATION: 1996 - 1997

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 96-03/319**

PROJECT TITLE: Connecticut River Watershed Restoration Project

NPS CATEGORY: Hydrologic Modification

INVESTIGATOR: Franklin County

LOCATION: Connecticut River Basin

DESCRIPTION: Bioengineering techniques will be used to repair eroded streambank in the upper Connecticut River at Turners Falls Power Pool. Implementation of these techniques will reduce sedimentation and the release of erosion-induce pollutants into the river. The project will demonstrate bioengineering on a large river with steep banks; previous bioengineering projects funded under the Department's S.319 program have been conducted on small low-order streams.

Specific tasks will include:

1. evaluate existing information for eroded sites along the Turners Falls Power Pool to determine where a variety of bioengineering techniques can be demonstrated;
2. select remediation sites based on likelihood of success, cost effectiveness, and value as tools for outreach and technology transfer; a total of 1000 to 3000 linear feet of eroded bank will be repaired at up to eight sites;
3. design and install bioengineering systems at the selected sites;
4. conduct quarterly monitoring of the project from pre-construction through final evaluation; and
5. maintain a complete record of the project in slide format; this slide record will document site features and appearance before work commences, phases of the bioengineering work, appearance of site immediately after the work has been completed, and subsequent growth of the installed plant materials. The slide record will be included with the final report, and will be used for a technical transfer seminar to be conducted under this project.

COST: \$351,100

FUNDING: \$142,500 by the U.S. Environmental Protection Agency  
\$200,000 by the Western Massachusetts Electric Company  
\$8,600 by the Franklin County Commission

DURATION: 1996 - 1998



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 96-04/319**

**PROJECT TITLE:** Demonstration of Urban Streambed Stabilization and Wetlands Function and Wildlife Habitat Improvement Using Soil Bioengineering Treatments at Hearthstone Quarry Brook, Chicopee

**NPS CATEGORY:** Hydrologic Modification

**INVESTIGATOR:** City of Chicopee

**LOCATION:** Chicopee River Basin

**DESCRIPTION:** Bioengineering will be used to restore an urban stream that has been adversely impacted by development within its watershed. The existing erosion problem has caused disturbance to the streambed and banks, resulting in loss of wetlands. In addition, the brook will be further impacted by increased storm water flows once combined sewer separation occurs; the bioengineering designs for the project will take into consideration this increase in flow.

Specific tasks will include:

1. bioengineering systems will be installed at Hearthstone Quarry Brook. Designs for these systems will be finalized prior to start-up of the 96-04 implementation project;
2. monitoring and maintenance plans will be developed for this installation. In addition, an assessment of erosion processes will be conducted and a long-term monitoring program will be developed to evaluate the success of bioengineering treatments. Pre- and post-construction wetland and wildlife habitat values also will be compiled and summarized, and
3. an on-site technical transfer presentation will be conducted.

**COST:** \$359,540

**FUNDING:** \$199,540 by the U.S. Environmental Protection Agency  
\$160,000 by the city of Chicopee

**DURATION:** 1996 - 1998

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 96-05/319**

**PROJECT TITLE:** Spicket River Watershed Revitalization

**NPS CATEGORY:** Urban Runoff

**INVESTIGATOR:** Merrimack River Watershed Council

**LOCATION:** Merrimack River Basin

**DESCRIPTION:** The goal of this project is to use the watershed approach to decrease nonpoint pollution in an ultra-urban area. An extensive cleanup, education and outreach program will be conducted by a variety of public and private groups. In addition, the project will demonstrate an innovative best management practice (BMP) for use in ultra-urban areas.

Specific tasks will include:

1. evaluate catch basin filters as an innovative BMP to reduce storm water sediment and petroleum hydrocarbon loadings from ultra-urban areas;
2. develop and conduct an extensive education and outreach program in the watershed; this outreach program will include producing outreach materials in Spanish for the large Hispanic population in this watershed; and
3. develop a monitoring program to measure the overall effectiveness of the project which includes both instream collection of samples for water quality analysis, as well as monitoring of public participation.

**COST:** \$144,585

**FUNDING:** \$49,285 by the U.S. Environmental Protection Agency  
\$52,300 by the GenCorp  
\$16,000 by the Merrimack River Watershed Council  
\$14,000 by the Department of Environmental Protection  
\$6,000 by the Lawrence Youth Commission  
\$4,000 by the Ferrous Foundry  
\$2,000 by the Greater Lawrence Sanitary District  
\$1,000 by the Department of Fisheries, Wildlife and  
Environmental Law Enforcement - Riverways Program

**DURATION:** 1996 - 1997

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 96-08/319**

PROJECT TITLE: Statewide Outreach Course and Tool Kit and Central Massachusetts Partnership Pilot

NPS CATEGORY: General

INVESTIGATOR: Worcester County Conservation Districts

LOCATION: Statewide

DESCRIPTION: This project will develop and deliver training tools to enable watershed groups to foster community stewardship of watershed ecosystems. The project will offer a public outreach course to watershed associations and other groups and conduct a "partnership for clean water" pilot project in Central Massachusetts to control nonpoint source pollution.

Specific objectives will be to:

1. provide community outreach, education and expertise to address NPS pollution;
2. assist watershed stakeholders to protect and restore local watershed ecosystems;
3. leverage public and private resources to manage local waterways;
4. strengthen capacity of watershed associations and conservation districts to build a constituency that can advance the Massachusetts Watershed Initiative; and
5. develop a model and framework for outreach activities throughout the state.

COST: \$43,900

FUNDING: \$10,900 by the U.S. Environmental Protection Agency  
\$33,000 by the Worcester County Conservation Districts, Natural resource conservation Service, Massachusetts Waterwatch Partnership, and Others

DURATION 1996 - 1997

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 96-09/319**

PROJECT TITLE: Sub-Basin Assistance for the SuAsCo and Charles River Watersheds

NPS CATEGORY: General

INVESTIGATOR: Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement, Riverways Program

LOCATION: Concord (Sudbury-Assabet-Concord) and Charles River Basins

DESCRIPTION: This project will provide support to conduct shoreline surveys and develop Adopt-A-Stream action plans for the priority watersheds of the SuAsCo and Charles River Basins. Broad-based constituencies will be developed consisting of local citizens, businesses, conservation districts, non-profit organizations, and town and state governments.

Specific tasks will include:

1. form up to four Stream Teams in each of the watersheds;
2. conduct up to four shoreline surveys and prepare Adopt-A-Stream Action Plans for each of the study watersheds;
3. prepare press articles for local media; and
4. submit shoreline survey information to the DFWELE GIS office.

COST: \$10,000

FUNDING: \$10,000 by the U.S. Environmental Protection Agency

DURATION: 1996 - 1997



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 96-10/319**

PROJECT TITLE: Watershed Display on Nonpoint Source Information, Basin Team Newsletter, and Resident Survey

NPS CATEGORY: General

INVESTIGATOR: Berkshire Conservation District

LOCATION: Farmington River Basin

DESCRIPTION: This project will develop a multi-faceted outreach program in the Farmington River Basin to educate basin residents to the causes and effects and mitigation of NPS pollution. These efforts are intended to supplement and enhance current planned outreach efforts of EOEA's Farmington Basin Team.

Specific tasks will include:

1. development of a display/information center for each of the major communities within the watershed (Otis, Sandisfield, Becket, Tolland) to educate and inform residents and town officials about watershed issues and why they are important;
2. continuation of the Farmington Basin Team Newsletter as an effective vehicle to keep citizens up-to-date on planning and assessment activities and implementation of water quality improvement efforts in their community; and
3. dissemination of a survey to watershed households to understand the perceptions and priorities of watershed stakeholders.

COST: \$8,735

FUNDING: \$8,735 by the U.S. Environmental Protection Agency

DURATION: 1996 - 1997

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 96-11**

PROJECT TITLE: Watershed Education Teaching (WET) Program

NPS CATEGORY: General

INVESTIGATOR: University of Massachusetts Cooperative Extension System, Amherst

LOCATION: Charles River and North Coastal Basins

DESCRIPTION: This project will support a program which introduces nonpoint source pollution into the science curriculum of schools in the Charles River and North Coastal Basins participating in the Watershed Education Teaching (WET) program. The project will also integrate and implement actions of the Massachusetts Bays Program's Comprehensive Conservation and Management Plan (CCMP) into the curricula of the school systems and environmental organizations in these basins by piloting the Massachusetts Bays Resource Guide for Educators.

Specific tasks will be to:

1. organize promote and present five two-day WET program series workshops to an expected 125 educators and 6,000 students; these workshops will introduce nonpoint source pollution into the science curriculum of schools in the Charles River and North Coastal Basins;
2. provide WET Kits, newsletters, and other materials to educators to conduct further training;
3. develop and present four, two-day program series workshops/seminars to watershed education experienced educators in the Charles River and North Coastal Basins, utilizing the Massachusetts Bays Resource Guide for Educators; workshops will be delivered in cooperation with local environmental organizations and target learning activities to issues in the watershed; an estimated 110 teachers will attend the workshops and subsequently reach 5000 students in the first year;
4. provide Massachusetts Bays Resource Guide for Educators related curricula, kits, and other materials to educators.

COST: \$40,466

FUNDING: \$22,548 by the U.S. Environmental Protection Agency  
\$17,918 by the University of Massachusetts Cooperative Extension System and the Massachusetts Bays Education Alliance

DURATION: 1996 - 1997

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 97-01/319**

**PROJECT TITLE:** Development of Stormwater Utilities in Two Demonstration Communities: Chicopee & South Hadley

**NPS CATEGORY:** Urban Runoff

**INVESTIGATOR:** City of Chicopee

**LOCATION:** Connecticut and Chicopee River Basins

**DESCRIPTION:** The proposed project seeks to address the problem of funding for comprehensive NPS pollution control by creating the first stormwater utilities in Massachusetts

Specific tasks will include:

1. establish a Stormwater Utility Development Advisory Committee from municipal governments, the business community, realtors and developers, citizens and neighborhood councils, and local water quality advocates to review, discuss and make decisions concerning the development of stormwater utilities in the two communities;
2. research a minimum of 10 existing stormwater utilities for information on fee structures and rates, administration, community relations, and legal framework;
3. develop a preferred assessment method for each community by determining the size of an ERU (Equivalent Residential Unit), identifying and preparing a cost-benefit analysis of three to four different assessment methods, and working with the advisory committee to select the preferred assessment method for each community;
4. develop a utility program and budget for each community;
5. determine an initial utility rate (i.e. the cost per ERU) for each community based on the assessment method and utility budget;
6. develop and pursue the implementation of a legal framework at both the state and local levels for the enactment of stormwater fees;
7. conduct community education and outreach activities by developing information materials, conducting media activities, and conducting presentations;
8. transfer the project information by creating and distributing a "How-to" Stormwater Utility Development Kit and conducting presentations.

**COST:** \$144,743

**FUNDING:** \$81,943 by the U.S. Environmental Protection Agency  
\$40,385 by the city of Chicopee  
\$17,600 by the town of South Hadley  
\$1,920 by the Chicopee Chamber of Commerce  
\$1,500 by the Chicopee Manufacturer's Association  
\$1,500 by the Chicopee River Watershed Council

**DURATION:** 1997 - 1998



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 97-02/319**

**PROJECT TITLE:** Red Lily Pond Rejuvenation

**NPS CATEGORY:** Sediment, Watershed Resource Restoration

**INVESTIGATOR:** Town of Barnstable

**LOCATION:** Cape Cod Coastal Drainage Area

**DESCRIPTION:** The purpose of this project is to restore the Red Lily Pond complex and return it to its former function as a valuable fish habitat and migratory fish spawning area. The project will utilize the new techniques of subsidence dredging and reverse relayering in order to deepen the pond and seal off the nutrients that have accumulated on the bottom of the pond. The existing weed growth in the pond will be removed by hydroraking the pond prior to dredging. Storm drainage from an adjacent road will be infiltrated to eliminate a direct discharge to the pond.

Specific tasks will include:

1. complete the final specifications for subsidence dredging and reverse layering, hydroraking and drainage improvements;
2. develop Quality Assurance Project Plan (QAPP) and conduct monitoring in accordance with approved plan, including mapping of aquatic flora and fauna by an independent biologist;
3. secure appropriate permits for the project;
4. install drainage improvements;
5. hydrorake pond and dispose of weeds;
6. subsidence dredge and reverse layer the south basin of Red Lily Pond and dispose of sand;
7. conduct three technology transfer seminars;
8. perform initial repairs to the herring run.

**COST:** \$426,404

**FUNDING:** \$160,800 by the U.S. Environmental Protection Agency  
\$160,399 by the town of Barnstable  
\$72,455 by the Commonwealth of Massachusetts  
\$32,750 by the Red Lily Pond Association, Inc.

**DURATION:** 1997 - 1999



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 97-03/319**

PROJECT TITLE: Technical Outreach to Communities Regarding Alternative On-Site Septic Systems

NPS CATEGORY: Land Disposal

INVESTIGATOR: Barnstable County Department of Health & the Environment

LOCATION: Cape Cod Basin

DESCRIPTION: The proposed project will supply ongoing technical assistance to communities relative to alternative on-site septic system technologies. The emphasis of the information will be performance data, permitting procedures and requirements, treatment efficacy, design specifications, monitoring and maintenance requirements, cost effectiveness and installation requirements. Outreach primarily will be focused toward Boards of Health and the design and engineering communities.

Specific project tasks include:

1. produce six technical documents discussing specific innovative on-site sewage treatment technologies which focus on systems capable of nitrogen removal;
2. distribute the technical documents to 69 Boards of Health (all Boards of Health in Barnstable County, the Buzzards Bay Coastal Drainage Area, and the Massachusetts Bays communities) and various other Board of Health members, public agencies, engineering firms and citizens in Barnstable County;
3. create and maintain a computer home page/web site for the exchange of technical information regarding alternative on-site septic systems and to serve the statewide audience.

COST: \$35,323

FUNDING: \$20,534 by the U.S. Environmental Protection Agency  
\$13,973 by the Barnstable County Department of Health & the Environment

DURATION: 1997 - 1998

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 97-04/319**

PROJECT TITLE: Alternative Septic Systems Technologies Workshop Program

NPS CATEGORY: Land Disposal

INVESTIGATOR: Berkshire Regional Planning Commission

LOCATION: Housatonic and Farmington River Basins

DESCRIPTION: This project will consist of presenting 15 to 20 workshops in the Housatonic and Farmington River Basins on Department of Environmental Protection approved alternative on-site septic system technologies, the septic system repair program and recent changes to Title 5. The objective of this project is to facilitate the use of alternative technologies in order to remediate water quality problems due to failing septic systems and to educate homeowners on proper septic system maintenance.

Specific tasks will include:

1. develop workshop program, agenda, visual aids, educational package schedule and mailing list;
2. conduct 15 to 20 workshops in communities with known septic system problems and communities involved in the Septic System Repair Program; targeted audience will consist of Boards of Selectmen, Planning Boards, Conservation Commissions, Boards of Health, engineers, contractors, realtors, attorneys, lake associations and the general public from all communities within the Housatonic and Farmington River Basins;
3. develop a questionnaire to assess participants awareness level and need for additional education efforts.

COST: \$34,000

FUNDING: \$20,400 by the U.S. Environmental Protection Agency  
\$5,500 by the Berkshire County Regional Planning Commission  
\$4,400 by the Tri-Town Health Department  
\$2,000 by the Pioneer Valley Planning Commission  
\$1,700 by the Berkshire Housing Development Corporation

DURATION: 1997 -1998

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 97-05/319**

PROJECT TITLE: Leak Prevention for Heating Oil Storage Systems

NPS CATEGORY: Underground Storage Tanks

INVESTIGATOR: Barnstable County Department of Health & the Environment

LOCATION: Cape Cod Coastal Drainage Area

DESCRIPTION: With the goal of protecting Cape Cod's sole source aquifer, the purpose of this project is to increase compliance with existing regulations on underground heating oil storage tanks (USTs). In addition, low cost effective containment methods for above ground fuel tanks (AGTs) and underground feed lines will be developed and distributed to interested parties.

Specific tasks will include:

1. increase the number of USTs registered by visiting Cape oil distributors to remind them of their responsibilities and potential liabilities under the existing health regulations; oil distributors will be encouraged to send letters to their customers who have unregistered USTs;
2. increase compliance with UST testing requirements by mailing certified letters to the estimated 300 UST owners who do not respond to the initial request for testing of their tank;
3. increase the number of USTs removed by sending letters to owners of active USTs mentioning the possibility of decreased removal costs through participation in a group "tank yank"; lists will be developed for each participating town and competitive bids for UST removal will be sought;
4. develop low cost effective containment procedures to reduce the threat of leaks from AGTs and underground lines by consulting with representatives of health and fire departments, the corrosion control industry, the heating oil industry, builders, plumbing and heating contractors and the Department of Environmental Protection;
5. work with town officials and local business people to pass a regulation or bylaw in Truro requiring containment of AGTs and underground lines;
6. produce and distribute a booklet explaining the proposed containment procedures for AGTs and underground lines; produce a model health regulation or bylaw implementing AGT and underground line containment procedures and distribute with a letter explaining the experiences of Truro in passing such a bylaw.

COST: \$34,507

FUNDING: \$20,534 by the U.S. Environmental Protection Agency  
\$13,973 by the Barnstable County Department of Health & the Environment

DURATION: 1997 - 1998



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 97-06/319**

**PROJECT TITLE:** Herring Restoration Weweantic River at Horseshoe Pond

**NPS CATEGORY:** Watershed Resource Restoration

**INVESTIGATOR:** Buzzards Bay Project

**LOCATION:** Buzzards Bay Basin

**DESCRIPTION:** Under his project a herring ladder will be installed at Horseshoe Pond on the Weweantic River to improve herring migration and open 85 acres of spawning habitat in this highly productive river system. Preliminary design for the fishway have been developed by the U.S. Fish and Wildlife Service.

Specific tasks will include:

1. complete the final design for the fishway;
2. secure appropriate permits for the project;
3. purchase materials for the ladder construction and install the herring ladder;
4. stock the Weweantic River at the appropriate time of year with approximately 5000 herring;
5. monitor increase in herring population in the Weweantic River through visual counts;
6. develop an educational display discussing herring populations in Buzzards Bay rivers; this display will be available to schools, libraries and town offices throughout the watershed.

**COST:** \$89,560

**FUNDING:** \$38,800 by the U.S. Environmental Protection Agency  
\$44,400 by the town of Wareham  
\$6,360 by the Division of Marine Fisheries

**DURATION:** 1997 - 1998



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 97-07/319**

PROJECT TITLE: Protecting Nitrogen Sensitive Coastal Embayments Through Land Conservation

NPS CATEGORY: Urban Runoff

INVESTIGATOR: Buzzards Bay Project

LOCATION: Buzzards Bay Basin

DESCRIPTION: This project will demonstrate the use of conservation restrictions and other land protection tools as Best Management Practices to protect sensitive coastal embayments from nitrogen inputs from increased development. The conservation restrictions and land protection tools will be implemented in two watersheds, Slocums River and Onset Bay.

Specific tasks will include:

1. develop a model conservation restriction which gives greater attention than is common in conventional restrictions to nitrogen management relevant issues such as fertilizer use, manure management, septic system maintenance and upgrades, and vegetated buffers;
2. develop a watershed land conservation plan by identifying and mapping all large landowners and land use characteristics within the Slocums River and Onset Bay watersheds and identifying the most critical parcels for conservation;
3. create and distribute outreach materials on the range of conservation options available to private landowners highlighting the model Conservation Restriction for nitrogen sensitive watersheds;
4. host two workshops for landowners in each pilot watershed to discuss land conservation options leading to direct work with approximately twelve landowners to establish land protection measures on their property;
5. implement conservation options through recorded title or deed restrictions.

COST: \$72,500

FUNDING: \$33,000 by the U.S. Environmental Protection Agency  
\$19,500 by the Massachusetts Environmental Trust  
\$12,000 by the Dartmouth Natural Resources Trust  
\$8,000 by the Plymouth County Wildlands Trust

DURATION: 1997 - 1998

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 97-08/319**

PROJECT TITLE: Hall's Pond Wetlands Restoration Project

NPS CATEGORY: Watershed Resource Restoration

INVESTIGATOR: Town of Brookline

LOCATION: Charles River Basin

DESCRIPTION: The purpose of this project is to restore one acre of wetlands at an urban conservation sanctuary.

Specific tasks will include:

1. complete the final design for the restoration of approximately one acre of wetlands and relocation of the pond outlet;
2. secure appropriate permits for the project;
3. purchase materials for the restoration and implement the wetlands restoration plan;
4. prepare a Quality Assurance Project Plan (QAPP) and conduct water quality and wetlands monitoring.

COST: \$114,596

FUNDING: \$68,757 by the U.S. Environmental Protection Agency  
\$37,839 by the town of Brookline  
\$8,000 by the Friends of Hall's Pond

DURATION: 1997 - 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 97-09/319**

PROJECT TITLE: Three Bay Area - Ropes Beach Subwatershed

NPS CATEGORY: Urban Runoff, Watershed Resource Restoration

INVESTIGATOR: Town of Barnstable

LOCATION: Cape Cod Watershed

DESCRIPTION: The purpose of this project is to capture and treat road runoff that is contributing to the contamination of Cotuit Bay, a prime shellfish location and gateway to two herring runs. Under this project a series of rock filled pools and channels will be installed. The pools will be preceded by sediment removal tanks and followed by an infiltration system. The net effect will be removal of sediment, bacteria and nitrogen.

Specific tasks include:

1. prepare final design and engineering drawings necessary to install the remediation system and secure appropriate permits;
2. perform site preparation, and purchase and install all components of the remediation system;
3. develop a Quality Assurance Project Plan (QAPP) and conduct monitoring based on the approved QAPP;
4. conduct a technology transfer presentation.

COST: \$157,050

FUNDING: \$92,700 by the U.S. Environmental Protection Agency  
\$64,350 by the town of Barnstable

DURATION: 1997 - 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 98-01/319**

PROJECT TITLE: Determining the Effectiveness of On-Site Septic Systems for the Removal of Viruses

NPS CATEGORY: Land Disposal

INVESTIGATOR: Barnstable County Department of Health & the Environment

LOCATION: Statewide

DESCRIPTION: The proposed project seeks to determine the removal efficiencies of standard Title 5 systems for viruses and provide a benchmark against which alternative on-site septic system technologies can be compared. In addition, this study endeavors to clarify some of the mechanisms of virus removal and suggest guidelines that Boards of Health can use in their review of variance requests from setback requirements of the regulations.

Specific tasks will include:

1. with the cooperation of the Department of Environmental Protection Wall Experimental Station, formulate a quality assurance project plan (QAPP) for sampling viruses beneath septic systems;
2. determine the virus removal effectiveness of standard Title 5 components and selected alternative on-site septic systems by implementing the QAPP;
3. publish test results in a minimum of two environmental publications, and incorporate results in the Correspondence Course for Boards of Health that is being developed under 319 project 95-07, Title 5 Training for Boards of Health in Five Towns in Barnstable County, MA; and
4. publish a final report which will include recommendations on how the information might be used to modify Title 5 if warranted.

PROPOSED COST: \$44,237

FUNDING: \$26,500 by the U.S. Environmental Protection Agency  
\$17,737 by the Barnstable County Department of Health & the Environment

DURATION: 1998 - 2000



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 98-03/319**

**PROJECT TITLE:** Coastal Embayment/Title 5 Training Video

**NPS CATEGORY:** Land Disposal

**INVESTIGATOR:** Cape Cod Commission

**LOCATION:** Cape Cod Watershed

**DESCRIPTION:** The proposed project will produce a video on methods to identify nitrogen-sensitive coastal embayments and to develop water quality protection and remediation strategies within their watersheds. This video can be utilized in training agency staff, local Boards of Health and other community-based watershed groups.

Specific project tasks include:

1. produce training video;
2. provide copies of video to the Department of Environmental Protection for distribution;
3. air video on local Cape Cod community access television and advertise its availability.

**PROPOSED COST:** \$20,000

**FUNDING:** \$12,000 by the U.S. Environmental Protection Agency  
\$8,000 by the Cape Cod Commission

**DURATION:** 1998 - 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 98-04/319**

PROJECT TITLE: Restoring Concord's Mill Brook: Nonpoint Source Pollution and Community Involvement

NPS CATEGORY: Watershed Resource Restoration, Urban Runoff

INVESTIGATOR: Division of Natural Resources, Town of Concord

LOCATION: Concord (SuAsCo)

DESCRIPTION: This project will continue to advance the work by the Mill Brook Task Force to restore and conserve the brook. Urbanization and the intensification of land use in the town have resulted in an increase in nonpoint source pollution, which is most evident in the buildup of sediment in the stream bed. By implementing a variety of best management practices (BMPs), this project will result in a reduction of NPS loadings to Mill Brook.

Specific tasks will include:

1. implement an innovative stormwater treatment technology at a high impact site;
2. retrofit four catch basins with new sump units and storm drain pillows or sump skimmers;
3. develop a Quality Assurance Plan (QAPP) and monitor to demonstrate the effectiveness of the BMPs installed under tasks 1 and 2;
4. work with the town DPW to develop a long-term plan with recommendations for catch basin technologies and maintenance;
5. work with the town DPW to train street maintenance and snow removal personnel in appropriate techniques to mitigate NPS impacts from these operations; review snow removal and street maintenance practices and develop new policies wherever feasible;
6. where allowed by permit, remove stream bottom sediment and conduct stream bank cleanup;
7. publish NPS pollution related articles in local publications and work with area schools to provide input into curricula regarding Mill Brook stewardship and NPS pollution.

PROPOSED COST: \$128,238

FUNDING: \$ 71,544 by the U.S. Environmental Protection Agency  
\$ 56,694 by the town of Concord

DURATION: 1998 - 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 98-05/319**

**PROJECT TITLE:** Nashawannuck Pond Watershed Restoration Project, Easthampton, MA

**NPS CATEGORY:** Watershed Resource Restoration

**INVESTIGATOR:** Pioneer Valley Planning Commission

**LOCATION:** Connecticut River Basin

**DESCRIPTION:** Nashawannuck Pond has been reduced in size by sedimentation, and heavy phosphorus loading resulting from this constant sediment loading is accelerating aquatic weed growth. This project will implement recommendations of a 1990 Diagnostic/Feasibility study, and build upon previous activities to improve the water quality of the pond.

Specific tasks will include:

1. review and update as necessary the 1990 plans for bank stabilization at four identified sites;
2. implement stabilization measures to eliminate erosion and sedimentation, prevent further slumping of the banks, and manage access near the pond to prevent future compaction of soil and erosion at the four sites;
3. conduct two half-day workshops on the Nashawannuck Pond Watershed and nonpoint source pollution control;
4. identify demonstration sites and BMPs to show in-the-field methods to improve water quality;
5. produce and distribute a watershed management brochure for Nashawannuck Pond which will inform stakeholders about NPS pollution and increase support for future watershed restoration.

**PROPOSED COST:** \$94,725

**FUNDING:** \$54,725 by the U.S. Environmental Protection Agency  
\$40,000 by the town of Easthampton

**DURATION:** 1998 - 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 98-06/319**

PROJECT TITLE: NPS Pollution Correction in the Farmington River Watershed - Dirt Roads BMP Handbook

NPS CATEGORY: Urban Runoff

INVESTIGATOR: Berkshire Regional Planning Commission

LOCATION: Farmington River Basin

DESCRIPTION: Dirt roads are one of the most prominent sources of nonpoint source pollution in rural areas. In the Farmington River Basin approximately 60% of the roads are dirt roads. This project will develop a Dirt Roads Best Management Practices Handbook for use by Highway Departments.

Specific tasks will include:

1. develop the Dirt Roads Best Management Practices Handbook that will provide detailed, practical instructions for BMP implementation;
2. select test case locations at which BMP implementation and road improvements will be demonstrated, and
3. conduct workshops on Dirt Road BMPs at which the Handbook will be distributed and the results of the test cases will be explained to Highway Superintendents in Berkshire County.

PROPOSED COST: \$73,750

FUNDING: \$43,950 by the U.S. Environmental Protection Agency  
\$24,800 by the town of Sandisfield  
\$5,000 by the Berkshire Regional Planning Commission

DURATION: 1998 - 2000



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 98-07/319**

**PROJECT TITLE:** Reducing Stormwater Pollution in an Ultra-Urban Watershed  
**NPS CATEGORY:** Urban Runoff  
**INVESTIGATOR:** City of Somerville, Department of Public Works  
**LOCATION:** Boston Harbor (Mystic River Basin)

**DESCRIPTION:** The overall objective of this project is to improve the water quality of Alewife Brook by treating and reducing stormwater discharges and developing recommendations for meeting stormwater goals in an ultra urban watershed. Elimination of combined sewer overflows (CSOs) to Alewife Brook is currently being completed. Modelling done by the MWRA has predicted that even with the elimination of the CSOs Alewife Brook will not meet Class B water quality standards due to stormwater discharges.

Specific tasks will include:

1. implement an innovative retrofit technology at a stormdrain outlet;
2. administer a watershed resident survey to identify environmentally detrimental behavior which results in nonpoint source pollution and conduct an outreach campaign designed to address this behavior;
3. identify and prioritize sites within the watershed where perviousness can be increased, develop recommendations and provide assistance to land owners in implementing recommendations; and
4. conduct a workshop for municipalities within the Alewife Brook watershed and another for Mystic River Basin municipalities on controlling nonpoint source pollution in ultra urban areas.

**PROPOSED COST:** \$118,700

**FUNDING:** \$71,900 by the U.S. Environmental Protection Agency  
\$18,200 by the Alewife/Mystic River Advocates  
\$15,100 by the city of Somerville  
\$13,500 by the department of Fisheries, wildlife and Environmental Law Enforcement, Riverways Program

**DURATION:** 1998 - 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 98-08/319**

**PROJECT TITLE:** Protection of First Herring Brook

**NPS CATEGORY:** Watershed Resource Restoration

**INVESTIGATOR:** Town of Scituate

**LOCATION:** South Coastal Basin

**DESCRIPTION:** This project focuses on the protection of First Herring Brook from nonpoint source pollution through the installation of infiltration best management practices (BMPs). First Herring Brook is a tributary to Old Oaken Bucket Pond, the source of the town's drinking water supply. Direct discharge of stormwater has led to the degradation of the Brook's water quality.

Specific tasks will include:

1. disconnect nine direct stormwater discharges in highly developed areas of the First Herring Brook subwatershed and install infiltration BMPs;
2. develop a Quality Assurance Project Plan (QAPP) for pre and post implementation monitoring of First Herring Brook to measure the effectiveness of the infiltration BMPs and conduct the monitoring in accordance with the QAPP; and
3. incorporate the infiltration system designs as standard specifications into the town's local regulations so contracted developers will have guidelines to follow.

**PROPOSED COST:** \$129,300

**FUNDING:** \$77,580 by the U.S. Environmental Protection Agency  
\$51,720 by the town of Scituate

**DURATION:** 1998 - 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 98-09/319**

PROJECT TITLE: Manual of Innovative/Alternative On-Site Wastewater Treatment Technologies

NPS CATEGORY: Land Disposal

INVESTIGATOR: University of Massachusetts- Amherst

LOCATION: Statewide

DESCRIPTION: This project will continue, add to, and update the Manual of Innovative/Alternative On-Site Wastewater Treatment Technologies developed under 319 project 96-02. The manual details the conceptual design of all alternative technologies currently approved by the Department of Environmental Protection, including any conditions to those approvals, advantages and disadvantages of these systems, and where these technologies are most appropriate. Each system description lists the parameters most important from a system performance point of view. Guidelines for system performance testing will be included, with detailed descriptions as to how and where to sample each alternative system.

Specific tasks will include:

1. review Department of Environmental Protection files and conduct literature search;
2. prepare updated innovative technologies manual, and
3. distribute updated manual.

PROPOSED COST: \$27,250

FUNDING: \$14,520 by the U.S. Environmental Protection Agency  
\$12,730 by UMass Amherst, Department of Plant and Soil Sciences

DURATION: 1998 - 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 98-11/319**

**PROJECT TITLE:** Development and Demonstration of Protocols for Evaluating Greywater Disposal Systems in Massachusetts

**NPS CATEGORY:** Land Disposal, Groundwater

**INVESTIGATOR:** Department of Environmental Protection

**LOCATION:** Statewide

**DESCRIPTION:** This project will assess groundwater and effluent quality data generated by piloting several greywater systems and use these data to develop greywater disposal and reuse guidance and regulations that adequately protect public health and the environment.

Specific tasks will include:

1. Select and pilot test four (4) greywater systems;
2. develop a Quality Assurance Project Plan (QAPP) for sampling and analysis;
3. conduct sampling and analysis of these systems including groundwater monitoring; and
4. develop draft guidance and regulations for disposal and reuse of greywater in Massachusetts.

**PROPOSED COST:** \$100,000

**FUNDING:** \$60,000 by the U.S. Environmental Protection Agency  
\$40,000 by the Massachusetts Department of Environmental Protection

**DURATION:** 1998-2000



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 98-12/319**

**PROJECT TITLE:** Demonstrating the Use of Eelgrass Monitoring to Assess Coastal Nonpoint Source Pollution

**NPS CATEGORY:** Demonstration

**INVESTIGATOR:** Department of Environmental Protection

**LOCATION:** Statewide

**DESCRIPTION:** This project will establish and demonstrate the use of eelgrass as an environmental indicator to assess water quality conditions in the North Coastal, South Coastal, Boston Harbor, Cape Cod and the Islands, and Buzzards Bay Coastal drainage area. By quantifying the relative health of the plants (presence/absence, depth, leaf density and length) the eelgrass habitat requirements of particular coastal embayments can be established. This will help provide a mechanism to relate anthropogenic inputs to the relative health of estuarine areas. The information obtained can be used to assist Watershed Teams better identify coastal waters that are impaired or in need of further assessment activities and/or potential management actions.

Specific tasks will include:

1. establish 40 transects or monitoring stations along coastal Massachusetts;
2. conduct surveys incorporating underwater videography, GPS surveying and high accuracy digital mapping to create an eelgrass monitoring data layer of the relative health of selected coastal areas where nutrient and other landuse inputs have adversely effected eelgrass resources;
3. determine the relationship between water quality and eelgrass beds;
4. produce a base map (ARC View) incorporating the fieldnotes - recorded data and representative scanned frames of the underwater video recording; and
5. conduct information transfer by archiving base map and making it available to user groups through the DEP/EOEA Mass GIS data distribution system.

**PROPOSED COST:** \$50,000

**FUNDING:** \$30,000 by the U.S. Environmental Protection Agency  
\$20,000 by the Massachusetts Department of Environmental Protection

**DURATION:** 1998-2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 99-01/319**

PROJECT TITLE: Alternative Septic System Test Center Project Monitoring

NPS CATEGORY: Demonstration Project/Groundwater

INVESTIGATOR: Buzzards Bay Project

LOCATION: Statewide

DESCRIPTION:

This project will concurrently monitor contaminant removal by twenty-one wastewater systems at the Alternative Septic System Test Center at the Massachusetts Military Reservation for 12 months. The monitoring will produce a scientifically valid body of data which will be disseminated to state regulators, local boards of health, installers and consumers through trade shows, newspaper articles, site visits, and through Website coverage.

Project goals are to: provide verified, comparable data for regulatory decision making; speed approval of technologies which have advanced contaminant removal, particularly nitrogen; and increase the variety of alternative systems approved to provide greater siting flexibility and thus reduce the cost to consumers and benefit the environment.

Specific tasks will include:

1. monitor six alternative and one conventional onsite wastewater technologies in triplicate for BOD, fecal coliform, TSS ammonium nitrate+nitrite, total dissolved nitrogen, particulate nitrogen and carbon, orthophosphate and total phosphorus. Monitoring will be done in accordance with an EPA-approved sampling protocol.
2. conduct outreach to disseminate monitoring program results through:
  - at least one NE Onsite Wastewater Trade Show co-sponsored by the BBP;
  - publication of two articles about the Test Center in local newspapers and journals such as *Small Flows* and *Environment Cape Cod*;
  - posting information about the Test Center on the BBP website including description of the facility, goals, testing procedures, notices of facility tours and trade shows; and
  - a report on the types, uses and performance characteristics of the conventional and alternative systems monitored during this project.

PROPOSED COST: \$187,738

FUNDING: \$112,643 by the US Environmental Protection Agency  
\$ 50,000 by the Massachusetts Environmental Trust  
\$ 16,095 by the Barnstable County Health and Environment Department  
\$ 9,000 by the Center for Marine Science and Technology

DURATION: 1999 - 2001

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 99-03/319**

PROJECT TITLE: Pontoosuc Lake Watershed Resource Restoration

NPS CATEGORY: Watershed Restoration Project

INVESTIGATOR: Berkshire Regional Planning Commission

LOCATION: Housatonic River Basin

DESCRIPTION:

Initial results of a comprehensive Diagnostic/Feasibility Study for Pontoosuc Lake in Pittsfield and Lanesborough indicate that stormwater runoff contains high levels of phosphorus and is exacerbating weed and algae infestations, and that nutrient loading from near-lake sources (residences, businesses, roadways, etc.) is a greater problem than agricultural runoff in the tributaries. This project will improve water quality in Pontoosuc Lake by beginning implementation of the recommendations of the D/F Study. Specifically, the project will correct priority storm drain problems at three stormwater outfalls in the northern cove of the lake by capturing the "first flush" of storm runoff and infiltrating it into the ground. The project will also include work with municipalities to begin a comprehensive program of source controls. Finally, directed outreach efforts will increase the awareness and environmental responsibility of all lake stakeholders.

Specific tasks will include:

1. design and install innovative stormwater infiltration technologies at three sites on the northern cove of Pontoosuc Lake in Lanesborough;
2. conduct volunteer monitoring of stormwater including rainfall volume, storm drain discharge, solids, conductivity and nutrient levels according to an EPA-approved sampling protocol. Monitoring will be conducted before and after installation of the stormwater infiltration technologies;
3. BRPC will work with Pittsfield, Lanesborough and the County Commissioners to implement a comprehensive program of source controls including septic management, road maintenance and weed harvesting on Pontoosuc Lake; and
4. BRPC will organize and present a workshop for lakeshore businesses to encourage property management efforts that protect the lake including plant material buffer strips, pervious paving materials and other practices to reduce runoff from parking areas.

PROPOSED COST: \$121,995

FUNDING: \$ 71,450 by the US Environmental Protection Agency  
\$ 7,000 by the Housatonic Valley Association  
\$ 21,470 by the City of Pittsfield  
\$ 20,000 by the Town of Lanesborough  
\$ 2,075 by the Berkshire County Commissioners

DURATION: 1999 - 2001



MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 99-04/319

PROJECT TITLE: Winsegansett Salt Marsh Restoration Project

NPS CATEGORY: Demonstration/Watershed Restoration Project

INVESTIGATOR: Buzzards Bay Project

LOCATION: Buzzards Bay Basin

DESCRIPTION:

The project will demonstrate restoration of the Winsegansett Salt Marsh, a 30-acre coastal wetland on the western shore of Buzzards Bay. A culvert beneath Winsegansett Avenue will be replaced with a larger box culvert. The restoration of natural tidal flow will increase salinity in the marsh and eliminate an existing stand of Phragmites. The end objective is to permit natural recolonization of spartina plant communities in the upper reaches of Winsegansett Marsh, thereby improving juvenile finfish and shellfish habitat and supporting the feeding habitats of local wildlife species, including the federally-listed endangered Roseate Tern and Osprey.

The project also includes publication and distribution of the "Atlas of Tidally Restricted Salt Marshes in Buzzards Bay" which can be used to target other salt marshes in need of similar restoration efforts.

Specific tasks will include:

1. design and installation of the box culvert at Winsegansett Avenue;
2. monitoring of pre- and post-construction water quality in accordance with an EPA-approved sampling protocol, and pre- and post-construction GIS mapping of the extent of salt marsh vegetation in Winsegansett Salt Marsh; and
3. printing and distribution of the "Atlas of Tidally Restricted Salt Marshes" to coastal communities in Buzzards Bay.

PROPOSED COST: \$ 42,400

FUNDING: \$ 22,500 by the US Environmental Protection Agency  
\$ 19,900 by the Town of Fairhaven

DURATION: 1999 - 2001



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 99-05/319**

PROJECT TITLE: Telecom City: Malden, Medford, Everett

NPS CATEGORY: Demonstration/Watershed Restoration Project

INVESTIGATOR: Mystic Valley Development Commission

LOCATION: Boston Harbor (Mystic) Watershed

DESCRIPTION: The project is part of a larger effort to redevelop a 200+ acre brownfield site along the Malden River where the cities of Malden, Medford and Everett meet. The focus of this project is to mitigate stormwater impacts to banks, buffers and surface water quality within the Malden River Corridor by implementing stormwater BMP's, and to develop data on the effectiveness of those BMP's at a difficult urban redevelopment site. The proponent's goal is to put the "environmental portion" of the larger redevelopment project, such as public recreational open space, stormwater controls and wetlands rehabilitation, in place before the proposed industrial redevelopment of the site begins and overrides environmental concerns.

Specific tasks will include:

1. monitoring in accordance with an EPA-approved sampling protocol to establish pre-construction parameters for NPS runoff quality, local hydrology and subsurface geology;
2. development of a model to quantify the predicted mitigation of NPS runoff impacts through BMP implementation;
3. design and implementation of stormwater BMP's and restoration of wetlands and wildlife habitat prior to commencement of the industrial redevelopment of the larger brownfields site;
4. six months of monitoring the BMP's operations and efficiency, and monitoring NPS runoff and surface water quality in accordance with an EPA-approved sampling protocol;
5. final calibration of the predictive model based on post-construction monitoring results; and
6. development of an outreach programs for the three host communities and outreach documenting the effectiveness of the BMP's implemented at an urban redevelopment site.

PROPOSED COST: \$250,000

FUNDING: \$150,000 by the US Environmental Protection Agency  
\$100,000 by the Mystic Valley Development Commission

DURATION: 1999 - 2001

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 99-06/319**

PROJECT TITLE: Development of a Rational Basis for Designing Recharging Stormwater Control Structures and Flow and Volume Design Criteria

NPS CATEGORY: Demonstration/Technical Assistance Project

INVESTIGATOR: University of Massachusetts-Amherst

LOCATION: Statewide

DESCRIPTION:

The Massachusetts Stormwater Standards Guidance recommends that 80% of total suspended solids (TSS) be removed from the first 0.5 inches of rainfall. The intensity of the rain event that produces this 0.5 inches will influence both the amount and quality of the TSS. A high intensity storm will produce high TSS with large and small grain sizes. A small intensity storm may have lower TSS but finer grained materials. The typical design standard for infiltration devices is based on flow rate rather than TSS removal rates. Therefore, the relationship between storm characteristics and infiltration device design needs to be clarified in order for the Standards to be applied by regulators.

The project will include a literature review and development of a numerical model of infiltration of stormwater through infiltration structures and the underlying soils. Inputs to the model will include hydraulic conductivity of all relevant porous media, the area of the infiltration structure, the volume of water to be infiltrated and local groundwater conditions. The output of the model will be the time required to complete infiltration. The model and its results can then be used to design and site infiltration structures to implement the Massachusetts stormwater management standards.

Specific tasks will include:

1. literature review and conceptualization of the numerical model;
2. model development, debugging and parameter investigation;
3. preliminary and full model runs;
4. data analysis and report preparation.

PROPOSED COST: \$ 53,943

FUNDING: \$ 32,135 by the US Environmental Protection Agency  
\$ 21,808 by the University of Massachusetts

DURATION: 1999 - 2001

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 99-07/319**

**PROJECT TITLE:** Design and Guidance for Shallow Trench Low Pressure Distribution Systems for the Massachusetts Title 5 Innovative/Alternative Septic System Program

**NPS CATEGORY:** Technical Assistance Project

**INVESTIGATOR:** University of Massachusetts- Amherst

**LOCATION:** Statewide

**DESCRIPTION:**

The project will provide performance data and design criteria for Shallow Trench Low Pressure Distribution Systems (STLPP's) and develop a Design Guidance Manual for the systems. STLPP's are a non-patenable alternative technology in widespread use outside of Massachusetts over the past 10 year. If performance of the systems proves to be acceptable, the data developed and the Design Guidance Manual can be used to draft approval letters for General and Remedial Use Certification by DEP under CMR 310 15.288(2) and STLPP's can become part of the Title 5 Innovative/Alternative Technologies Program.

Specific tasks will include:

1. review and compilation of available performance and design data for STLPP's;
2. outline and preparation of the Design Guidance Manual;
3. review of the draft manual by 10 outside reviewers (DEP, Boards of Health or their agents, engineers and sanitarians);
4. completion of the Design Guidance Manual; and
5. distribution and presentation of the Manual to DEP staff and all Massachusetts Boards of Health through free mailing and workshop presentations.

**PROPOSED COST:** \$ 43,089

**FUNDING:** \$ 25,402 by the US Environmental Protection Agency  
\$ 177,687 by the University of Massachusetts

**DURATION:** 1999 - 2001



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 99-08/319**

**PROJECT TITLE:** Mill River Watershed Restoration Project

**NPS CATEGORY:** Watershed Restoration Project

**INVESTIGATOR:** Franklin Regional Council of Governments

**LOCATION:** Connecticut Watershed

**DESCRIPTION:** This project will permanently stabilize portions of the Mill River riverbank using soil bioengineering techniques. This will prevent erosion which currently threatens the Whately Water Department's water supply well and a monitoring well, and will preserve the values of the natural stable stream form. Because of the difficulties associated with siting and developing any water supply source, and the lack of a clear alternative site for the Whately Water Department, relocating the wells would be difficult. In addition, a cut through the meander bend at this location may establish a pattern of instability that will spread upstream as a "head cut" resulting from the change in gradient brought about by the channel shortening. Repair of the bank will not only protect a critical drinking water supply, but it will also prevent what is now a localized instability from spreading through the watershed.

Specific tasks will include:

1. develop a request for proposals to design, permit and construct appropriate soil bioengineering bank reconstruction on the eroded streambank;
2. construct the soil bioengineering bank stabilization features;
3. inspect the streambank annually for vegetation viability and project stability according to standard protocols approved by DEP; and
4. conduct a technology transfer workshop organized jointly by the FRCOG and the Whately Water Department, with handout and presentation materials prepared by both parties.

**PROPOSED COST:** \$ 62,875

**FUNDING:** \$ 37,600 by the US Environmental Protection Agency  
\$ 25,275 by the Town of Whately

**DURATION:** 1999 - 2001



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 99-09/319**

**PROJECT TITLE:** Demonstration of Best Management Practices to control Agricultural Nonpoint Source Pollution

**NPS CATEGORY:** Agriculture

**INVESTIGATOR:** Massachusetts Department of Food and Agriculture

**LOCATION:** Statewide

**DESCRIPTION:** This project will demonstrate how successful implementation of Best Management Practices (BMP's) and farm plans by farmers in targeted watersheds can prevent, control and abate the generation of agricultural nonpoint source pollution.

Specific tasks will include:

1. administering an agricultural nonpoint source pollution control program;
2. providing farmers with the knowledge and technical assistance necessary to identify nonpoint source generating activities; and
3. providing technical assistance to farmers to voluntarily implement BMP's.

**COST:** \$100,963

**FUNDING:** \$62,238 by the US Environmental Protection Agency  
\$38,725 by the Massachusetts Department of Food and Agriculture

**DURATION:** 1999-2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 00-01/319**

PROJECT TITLE: Implementing the Diagnostic/Feasibility Study Recommendations for Onota Lake  
NPS CATEGORY: Watershed Restoration  
INVESTIGATOR: Berkshire Regional Planning Commission  
LOCATION: Housatonic River Basin  
DESCRIPTION:

This project will implement in-lake and watershed management techniques recommended in a comprehensive Diagnostic/Feasibility Study prepared by International Technology Corporation for Onota Lake. This comprehensive approach will reduce the immediate impacts from accelerated eutrophication as well as control the causes of that eutrophication. The project builds upon prior implementation activities and demonstrates the strong support and commitment the City of Pittsfield has made to improving water quality in this important recreational water body.

The overall goal of abating the accelerated eutrophication of Onota Lake will be accomplished through the continued implementation of in-lake restoration and watershed management measures to reduce nutrient and sediment loading. Implementation of these measures will improve water quality, improve fish habitat, and improve recreational use of the lake.

Specific tasks will include:

1. short-circuit nutrient rich water entering the lake from north basin tributaries by installing a culvert under the Thomas Island causeway;
2. evaluate long-term changes in water quality in the lake as well as measuring pre- and post-installation impacts of the bridge culvert installation through a volunteer monitoring program;
3. decrease the density and distribution of aquatic weeds through a comprehensive weed control program;
4. decrease the contribution of stormwater-related pollutants and sediments through stormwater retention/detention basins;
5. reduce soil transport and subsequent lake filling from existing erosion sties, including erosion sites in Burbank park, through an erosion control program; and
6. prevent and reduce nutrient inputs into the lake through a public education/involvement/outreach program.

COST: \$283,900

FUNDING: \$167,000 by the US Environmental Protection Agency  
\$6,000 by the Berkshire Regional Planning Commission  
\$104,950 by the City of Pittsfield  
\$5,950 by the lake Onota Preservation Association

DURATION: 2000 – 2002

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 00-02/319**

PROJECT TITLE: Alternative Septic System Test Center Project Monitoring II

NPS CATEGORY: Demonstration Project/Groundwater

INVESTIGATOR: CZM Buzzards Bay Project

LOCATION: Statewide

DESCRIPTION: This project will continue the monitoring of contaminant removal by twenty-one wastewater systems at the Alternative Septic System Test Center at the Massachusetts Military Reservation undertaken in project 99-01/319. The monitoring will produce a scientifically valid body of data which will be disseminated to state regulators, local boards of health, installers and consumers through trade shows, newspaper articles, site visits, and through Website coverage.

Project goals continue to be to: provide verified, comparable data for regulatory decision making; speed approval of technologies which have advanced contaminant removal, particularly nitrogen; increase the variety of alternative systems approved to provide greater siting flexibility and thus reduce the cost to consumers and benefit the environment; and provide needed baseline data about the conventional system's contaminant removal capabilities.

Specific tasks will include:

1. monitor six alternative and one conventional onsite wastewater technologies in triplicate for BOD, fecal coliform, TSS ammonium nitrate+nitrite, total dissolved nitrogen, particulate nitrogen and carbon, orthophosphate and total phosphorus. Monitoring will be done in accordance with an EPA-approved sampling protocol.
2. conduct outreach to disseminate monitoring program results through:
  - at least one NE Onsite Wastewater Trade Show co-sponsored by the BBP;
  - two onsite information tours of the test facility for local, state and regional regulators;
  - publication of two articles about the Test Center in local newspapers and journals such as *Small Flows* and *Environment Cape Cod*;
  - posting information about the Test Center on the BBP website including description of the facility, goals, testing procedures, notices of facility tours and trade shows; and
  - a report on the types, uses and performance characteristics of the conventional and alternative systems monitored during this project.

COST: \$190,500

FUNDING: \$112,500 by the US Environmental Protection Agency  
\$41,400 by the Massachusetts Environmental Trust  
\$7,200 by the Barnstable County Health and Environment Department  
\$11,000 by the Center for Marine Science and Technology  
\$4,800 by the Cape Cod Community College  
\$5,000 by technology vendors

DURATION: 2000 - 2002



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 00-03/319**

PROJECT TITLE: Development of a Rapid Field Test for the Quality of Stone Aggregate in Onsite Septic Systems

NPS CATEGORY: Demonstration Project/Groundwater

INVESTIGATOR: Barnstable County Department of Health and the Environment

LOCATION: Statewide

DESCRIPTION: This project will develop and/or validate a simple field test for quality of stone aggregate used in the soil absorption portions of onsite septic systems. The overall goal is to encourage the production of better quality aggregate. Involvement of both industry and regulatory entities at critical points in the research will help ensure useful results.

Project goals are:

- absorption systems and meet the intent of Title 5 to prevent the intrusion of fine-textured material at the system-soil interface;
- to determine the validity of the various simple field tests (i.e., the bucket test) in predicting the level of fine-textured material in aggregate samples;
- to correlate the findings of simple field tests with the actual level of impairment to the leaching facility imparted by the level of fines observed;
- to refine the test for aggregate such that the result will indicate an appropriate level of "clean" that is neither too restrictive/cost prohibitive, nor too lenient as to decrease the life of a leaching facility;
- to produce a guidance document that will describe the appropriate methodology for testing aggregate in the field and to provide training workshops for its use.

Specific tasks will include:

1. research all existing rapid tests for the quality of stone aggregate used in onsite septic system leachfields;
2. develop a methodology for testing the quality of aggregate. In this context, aggregate testing means actually testing/observing what effect the aggregate quality has on the percolation rate of the soil it is installed in;
3. construct scaled-down leachfields that can be loaded with liquid effluent at a rate comparable to the of Title 5 in order to conduct full-scale tests of stone aggregate quality;
4. conduct tests on 30-40 loads of aggregate, including all appropriate rapid field tests and actual full-scale tests so that the results of the rapid field test and full-scale tests can be correlated and the most useful and accurate field tests can be identified; and
5. conduct at least six workshops demonstrating the most appropriate methods for testing aggregate in the field.

COST: \$ 28,500

FUNDING: \$ 17,000 by the US Environmental Protection Agency

\$ 11,500 by the Barnstable County Health and Environment Department

DURATION: 2000 - 2002



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 00-04/319**

PROJECT TITLE: Connecticut River Watershed Restoration - Phase II  
NPS CATEGORY: Watershed Restoration/Demonstration Project  
INVESTIGATOR: Franklin Regional Council of Governments  
LOCATION: Connecticut Basin

**DESCRIPTION:**

The project will continue bioengineering streambank stabilization begun as an earlier 319 project (Connecticut River Watershed Restoration 96-03/319). Streambank stabilization will be done at the Turners Falls Power Pool, extending from Turners Falls to the Vermont/New Hampshire border, which is experiencing severe erosion. In this regional severe erosion is increasing nonpoint source pollution in an important anadromous and freshwater fisheries habitat, is causing the loss of prime agricultural land and the loss of woody riparian buffer habitat used by migratory birds, eagles and other wildlife. Bioengineering techniques using native vegetation and natural materials to stabilize the eroding sites will be employed. The project will also include continued monitoring of the previously completed stabilization project funded through the 319 program.

The project goals are to build on the success of the previous Connecticut River bioengineering projects in restoring and stabilizing severely eroding streambanks, and to demonstrate the effectiveness of "soft" bioengineering as an alternative to riprap and conventional shoreline armoring.

Specific tasks will include:

1. repairing approximately 1000 linear feet of eroded streambank using bioengineering techniques. This will include site selection design preparation, permitting selection of contractor and supervision of design construction and installation;
2. developing an EPA-approved Quality Assurance Project Plan for monitoring of the bioengineered sites;
3. monitoring the sites from pre-construction through evaluation of the project's initial and long-term success, and for continued maintenance. Monitoring will be conducted at least on a quarterly basis following installation; and
4. technology transfer for resource and regulatory professionals who may be interested in applying similar techniques at other locations. Outreach will include site tours, a poster session at the MACC annual meeting, creation of a website describing the use of bioengineering for streambank restoration and informational materials including a cost analysis and written project summary.

COST: \$480,716

FUNDING: \$178,971 by the US Environmental Protection Agency  
\$ 10,745 by the Franklin Regional Council of Governments  
\$291,000 by the Western Massachusetts Electric Company

DURATION: 2000 - 2002

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 00-05/319**

PROJECT TITLE: Atlas of Stormwater Discharges  
NPS CATEGORY: Stormwater/Technical Assistance  
INVESTIGATOR: CZM Buzzards Bay Project  
LOCATION: Buzzards Bay Basin

**DESCRIPTION:**

This project will prepare, print and disseminate a "user friendly" *Atlas of Stormwater Discharges* for the Buzzards Bay. The *Atlas* will then be used for an outreach program designed to assist Buzzards Bay communities in preparing grant application to the DEP 319 and MCZM CPR grant programs to mitigate stormwater discharges into the Bay. The completed *Atlas* will provide communities and EOEa Watershed Teams with a valuable tool for determining where stormwater mitigation projects will provide the "most bang for the buck".

The project is an important first step in implementing the Buzzards Bay Comprehensive Conservation and Management Plan (CCMP), one of the first comprehensive watershed management plans to be completed in the Commonwealth. One of the priority management issues identified in the CCMP is control and remediation of stormwater discharges impacting the water quality of Buzzards Bay. Investigations by the Buzzards Bay Project and Division of Marine Fisheries have identified stormwater runoff as the primary factor in most of the Bay's shellfish bed closures. Today, more than 10,000 acres of shellfish beds in Buzzards Bay are closed to harvest due to elevated levels of fecal coliform bacteria with a subsequent loss of economic opportunity to coastal communities. Due to the unique nature of the Buzzards Bay coastline, restoration of Bay water quality is highly dependent on localized remediation of stormwater runoff.

Specific tasks will include:

1. compile available water quality data for Buzzards Bay;
2. complete and distribute the *Atlas of Stormwater Discharges* on paper and in digital form to local DPW's conservation Commissions, Boards of Health, Planning Boards, Regional Planning Agencies, advocacy groups, watershed organizations and state and federal transportation agencies;
3. use the *Atlas* to identify areas in need of additional water quality monitoring;
4. use the *Atlas* to assist local communities and other organizations to identify priority sites for stormwater remediation.

COST: \$41,000

FUNDING: \$25,000 by the US Environmental Protection Agency  
\$16,000 by the Massachusetts Environmental Trust

DURATION: 2000 - 2002



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 00-06/319**

**PROJECT TITLE:** Management Strategies for Massachusetts Dairy Farms to Reduce the Risk of Nonpoint Source Pollution

**NPS CATEGORY:** Technical Assistance

**INVESTIGATOR:** University of Massachusetts-Amherst

**LOCATION:** Statewide

**DESCRIPTION:** The crop, dairy and livestock industries are important contributors to the Massachusetts economy through the services and industries they support. The 1997 New England Agricultural Statistics reported that in 1996 the value of animal output was \$107 million, with more than \$70 million attributable to the dairy industry. Dairy and livestock farmers also contribute to maintaining open space in the Commonwealth by managing 134,000 acres of hay, pasture, and silage. This open space is important to both non-farm residents and tourism. However, on a typical dairy farm there is often an over-supply of farm nutrients on crop land, particularly nitrogen (N), together with phosphorus and potassium, from excess application of dairy manure and from crop residues and commercial fertilizer. This creates a significant nonpoint source pollution risk for both ground and surface waters.

This project's goal is to reduce the risk of nonpoint source pollution from dairy farms through development of nutrient management plans for 15-25 dairy farms and through the voluntary adoption of BMP's by farmers. The project will establish an inter-agency advisory committee, conduct educational workshops and meetings, produce educational tools and materials, conduct on-farms demonstrations and educational programs, and provide technical assistance to farmers wishing to implement nutrient management plans.

Specific tasks will include:

1. establish an Inter-agency Advisory committee to advise and assist in project design, Agency and farmer involvement, management recommendations, data collection, and program implementation;
2. conduct one to two educational workshops each year providing information on soil basics, manure management, whole-farm nutrient planning, and best management practices for nutrients, pesticides and biosecurity;
3. develop worksheets, computer programs and educational materials for nutrient management planning;
4. develop customized nutrient management plans for 15 to 25 farms each year and implement the recommended BMP's; and
5. implement on-farm demonstration and educational programs for farmers.

**COST:** \$250,718

**FUNDING:** \$149,431 by the US Environmental Protection Agency  
\$101,287 by the University of Massachusetts-Amherst

**DURATION:** 2000 - 2002

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 00-07/319**

**PROJECT TITLE:** Town of Acton Nonpoint Source Control Program  
**NPS CATEGORY:** Subwatershed/Demonstration Project  
**INVESTIGATOR:** Town of Acton  
**LOCATION:** Concord (SuAsCo)  
**DESCRIPTION:** This project will address two separate issues in the Town of Acton. The Town of Acton must implement a Watershed Trading Program developed in 1998 in order to be considered for an EPA NPDES permit to discharge treated wastewater effluent to the Assabet River. EPA has set a goal of 3:1 for this project, meaning that for every pound of phosphorous discharged into the river from the treatment plant, 3 pounds must be prevented from entering the waterway via nonpoint sources. Acton's Watershed Trading Program recommends both structural and non-structural stormwater BMP's in order to achieve the necessary reductions in phosphorous loading. The project will provide a valuable test case for trading programs that are being promoted as one means available to communities to meet the requirements of the Phase II Stormwater NPDES Program which will become effective over the next few years.

The first portion of the project will implement stormwater BMP's to demonstrate that phosphorous reduction can be achieved to the level required under the trading program. It is not anticipated that this project alone will achieve all required reductions, rather that evidence will be provided to satisfy the Town and EPA that the goal can be achieved. Full implementation of the trading program would then follow over the next few years.

The second portion of the project will also focus on mitigation of phosphorus in surface waters. The Town's newly created 9-acre public swimming pond has relatively high background phosphorous concentrations. The Town will construct a pond/wetland recirculation system that will be used to reduce background phosphorus levels in the pond in an effort to prevent phosphorous levels from reaching a point that would support the growth of nuisance levels of algae and macrophytes in the pond.

Specific tasks will include:

1. identification of specific sites where the Town has access and resources to install BMP's;
2. sampling of stormwater runoff to establish pre-BMP water quality;
3. construction of BMP's;
4. sampling of stormwater runoff to establish post-BMP water quality; and
5. documentation of the project's success and extrapolation to reach the wider Watershed Trading Program's goals.

Tasks to be completed as part of the pond recirculation portion of this project include:

1. design and construction of the wetland recirculation system
2. design and construction of a handicap accessible trail and viewing area
3. completion of a demonstration project manual; and
4. development and production of public education materials.

**COST:** \$177,740  
**FUNDING:** \$106,644 by the US Environmental Protection Agency  
\$71,096 by the Town of Acton  
**DURATION:** 2000 - 2002



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 00-08/319**

**PROJECT TITLE:** Long Pond Restoration Project, Littleton, MA

**NPS CATEGORY:** Watershed Restoration/Inlake

**INVESTIGATOR:** Town of Littleton

**LOCATION:** Concord (SuAsCo)

**DESCRIPTION:** Eutrophication of Long Pond has led to extremely dense macrophyte growth along the shoreline of the pond, with subsequent degradation of the recreational uses of the pond. Restoration of the recreational and aesthetic values of the pond are overall goals of this project. The water quality impacts of storm drains and septic systems are probably factors in the accelerating rate of eutrophication in the pond, and so will be targeted in this project along with implementation of inlake watershed restoration measures.

The project is a Phase II (implementation) project for the restoration of the pond. The goal is to restore water quality and recreational value of Long Pond through the implementation of a watershed management program identified in a 1990 Diagnostic/Feasibility Study. The recommended short-term elements of the program include removal of nuisance plants via macrophyte hydrotanking and installation of bottom barriers in selected areas. Long-term recommendations include installation of a treatment system (detention basin) designed to reduce nutrient and suspended sediment inputs to Long Pond, a watershed maintenance program, and development of an educational program aimed at the abutters and users of Long Pond. The educational program will include information on the use and misuse of storm drains, septic system maintenance and upgrades, restrictions on lawn fertilization, protection of shoreline integrity, and disposal of organic material in waterways. Finally, the project will include development of regulations and water resource bylaws to control development on pre-existing undersized lots within the Long Pond watershed.

Specific tasks will include:

1. develop a QAPP for pre- and post-construction water quality monitoring;
2. conduct macrophyte hydrotanking along the northeastern embayment;
3. install benthic barriers at the deeper regions around the town beach to prevent encroachment by future macrophyte growth and keep the public swimming area intact;
4. design and construct a stormwater detention basin/lagoon system;
5. conduct at least one educational workshop and distribute approximately 5,000 educational brochures to area residents on the concepts of sound "urban housekeeping" in the Long Pond watershed.

**COST:** \$313,000

**FUNDING:** \$185,000 by the US Environmental Protection Agency  
\$128,000 by the Town of Littleton

**DURATION:** 2000 - 2002

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 00-09/319**

PROJECT TITLE: Onset Bay, Wareham, MA, Nonpoint Source Pollution Remediation Project  
NPS CATEGORY: Watershed Restoration  
INVESTIGATOR: Town of Wareham  
LOCATION: Buzzards Bay Basin  
DESCRIPTION: The northern portion of Onset Bay is closed to shellfishing from May 1<sup>st</sup> through November 1<sup>st</sup>, due in large part to fecal contamination associated with stormwater runoff. The 1989 report entitled *Sanitary Survey Report of Onset Bay in the Towns of Bourne and Wareham* identified fecal contamination as the principal contributing factor in shellfish area closures in the area. The Town of Wareham has made substantial investment to sewer the Onset and Point Independence areas and so has virtually eliminated failing or substandard septic systems as a source of fecal contamination to the Bay. The Town has also undertaken a comprehensive stormwater management program and has made significant progress in remediating stormwater discharges at several problem area in town.

This project will address four stormwater outfalls that discharge directly into Onset Bay from South Boulevard and the Onset Town Pier. The project augments previous projects undertaken by the Town of Wareham to remediate stormwater impacts to local shellfish beds.

The goals of the project are to upgrade the seasonally closed shellfishing areas of Onset Bay and to mitigate the direct stormwater discharges located at public beaches along South Boulevard. Remediation efforts at the four stormwater discharges will concentrate on subsurface infiltration of the "first flush" or the first one-half inch of runoff from a precipitation event. Soil conditions at the sites are mapped as Carver coarse sands with water tables expected to be in excess of six to ten feet below grade. These soils are excellent for stormwater infiltration and will provide a high degree of treatment. Critical catch basin structures will also be upgraded to provide deep sumps, hoods and pipes to infiltration chambers.

All improvements will occur on town-owned land. Drainage structure improvement will typically occur within the roadway layout. The infiltration structures should be located outside the paved roadway on adjacent town-owned land.

Specific tasks will include:

1. develop a QAPP for pre- and post-construction water quality monitoring;
2. design and construct stormwater remediation BMP's for four stormwater outfalls;
3. conduct pre- and post-construction water quality monitoring;
4. conduct public outreach about the project through public hearings and local newspaper coverage; and
5. conduct at least one educational workshop and distribute educational brochures to area residents on the concepts of sound "urban housekeeping" and the potential sources of fecal contamination to Onset Bay.

COST: \$218,000  
FUNDING: \$130,800 by the US Environmental Protection Agency  
\$87,200 by the Town of Wareham  
DURATION: 2000 - 2002



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
SECTION 319 NPS PROJECT 00-10/319**

**PROJECT TITLE:** Shaw's Plaza Drainage Nonpoint Source Pollution Management

**NPS CATEGORY:** Stormwater/Groundwater

**INVESTIGATOR:** Town of Sharon

**LOCATION:** Taunton River Basin

**DESCRIPTION:** The project will develop and implement an NPS pollution management plan for the Shaw's Plaza parking lot drainage system located in the Billing Brook subbasin in Sharon. The management plan is needed to control untreated, unfiltered contaminants from the parking lot that currently discharge directly into Billings Brook. The discharge is located ¼ mile from one of Sharon's public water supply wells, and within 1½ miles of another of Sharon's public water supply wells, and four public water supply wells for the Town of Foxboro. Water from the parking area has an impact on the water quality of Billing's Brook, an impact on the health of the wetlands that recharge the six nearby public water supply wells, and perhaps on the quality of the drinking water from the municipal wells.

Due to the configuration of the parking lot site and ownership of the adjacent lands, it is difficult to treat the runoff using the traditional methods of above ground detention, settling and velocity reduction. Therefore, it is anticipated that in-ground stormwater treatment technologies will be used on the site.

Specific tasks will include:

1. develop a methodology to determine and implement appropriate stormwater BMP's to control runoff from the Shaw's Plaza parking lot;
2. construct a drainage system with all identified BMP's and including oil/gas separator type catch basins and infiltrators;
3. develop a maintenance program designed to ensure continued proper functioning of the drainage system and BMP's, and
4. initiate a public-education program on the concepts of sound "urban housekeeping" and potential impacts of NPS contaminants from roads and parking lots on downstream resources.

**COST:** \$48,500

**FUNDING:** \$26,000 by the US Environmental Protection Agency  
\$22,500 by the Town of Sharon

**DURATION:** 2000 - 2002



## **Section IV. MWI Grant Funded Projects for FY99**

### **MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-01/MWI**

PROJECT TITLE: Beaver Brook Daylighting Feasibility Study  
INVESTIGATOR: U.S. Army Corps of Engineers - New England District  
LOCATION: Blackstone River Basin  
DESCRIPTION: This project will further study the feasibility of restoring or "Daylighting" Beaver Brook in the City of Worcester.

It is proposed that a 3500 foot reach of Beaver Brook presently existing as a culverted channel be replaced by a 16 foot wide open channel. Side slopes and a 50 foot wide riparian corridor would be vegetated with shrubs and trees. Boulders and deflectors would be added to provide instream habitat for fish and other aquatic life. A system of small ponds and marsh would be constructed to improve water quality and provide additional fish and wildlife habitat. Approximately 2 acres of an adjacent parking lot would be restored to provide additional green space.

The additional investigations will address hydraulic issues and concerns relative to potential odor and other water quality problems possibly caused by cross connections or combined sewer overflows.

Specific tasks will include:

1. conduct hydrologic and hydraulic studies to determine the impacts of the proposed project on flooding;
2. establish environmental design features and criteria and prepare preliminary construction drawings;
3. determine environmental benefits and costs of daylighting Beaver Brook, including construction and maintenance costs;
4. address ownership issues; and
5. prepare a preliminary findings report and a final feasibility study report.

COST: \$100,000

FUNDING: \$50,000 by EOEA  
\$50,000 by the U.S. Army Corp of Engineers

DURATION: 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-02/MWI**

PROJECT TITLE: Boston Harbor Hydrologic and Water Quality Investigations

INVESTIGATOR: U.S. Geological Survey

LOCATION: Boston Harbor Basin

DESCRIPTION: The purpose of this project is to conduct hydrologic investigations and water quality sampling in support of assessment activities of the Boston Harbor Watershed Team. The information collected will be used to assess water quality conditions in the Mystic, Neponset and Weymouth and Weir River Basins of the Boston Harbor Watershed.

Specific tasks will include

1. design a water quality sampling network for the Mystic, Neponset and Weymouth and Weir River Basins;
2. conduct streamflow measurements at multiple sites in the Boston Harbor Watershed and rating the stage – discharge relation; and
3. conduct water quality sampling for nutrients, bacteria and metals and perform field measurements for pH, dissolved oxygen, temperature and specific conductance.

COST: \$95,000

FUNDING: \$90,000 by EOEA  
\$5,000 by the US Geological Survey

DURATION: 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-03/MWI**

**PROJECT TITLE:** Nutrients, Eutrophication and Harmful Algal Blooms in Buzzards Bay, Massachusetts

**INVESTIGATOR:** University of Massachusetts – Dartmouth

**LOCATION:** Buzzards Bay Basin

**DESCRIPTION** The purpose of this project is to further analyze water quality and biological samples collected since 1987 in Buzzards Bay. This will be accomplished by completing taxonomic analyses of selected phytoplankton samples and completing analyses and consolidation of nutrient and other data collected.

Specific tasks will include

1. perform quantitative taxonomic analyses of phytoplankton community composition;
2. complete analyses and reduction of nutrient chlorophyll and other water quality data;
3. conduct a formal presentation to the EOEa Buzzards Bay Watershed Team and associated watershed partners; and
4. prepare a draft and summary report which includes data tables and graphics for nutrients, plankton and associated data.

**COST:** \$70,060

**FUNDING:** \$70, 060 by EOEa

**DURATION:** 1998 – 1999



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-04/MWI**

PROJECT TITLE: Implementation of Municipal and Business Outreach Strategy

INVESTIGATOR: National Park Service

LOCATION: Merrimack River Basin

DESCRIPTION: This project will continue work begun in 1998 to reach out to the municipalities and to businesses in the Merrimack River Basin and develop an awareness and involvement by building partnerships.

Specific tasks will include:

1. identify key municipal officials in each of 31 communities and businesses and create a working database of contacts;
2. prepare a slide presentation highlighting the Merrimack River Watershed;
3. prepare printed materials about the watershed, the Watershed Team, and the Massachusetts Watershed Initiative;
4. conduct a series of presentations to municipal boards, community and business groups; and
5. prepare and disseminate a newsletter highlighting the status of work done as part of the Merrimack Watershed Team effort.

COST: \$53,000

FUNDING: \$27,000 by EOE  
\$26,000 by the NPS and Merrimack River Watershed Council

DURATION: 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-05/MWI**

**PROJECT TITLE:** Characterization of Polychlorinated Biphenyls (PCB's) in the Millers River Watershed

**INVESTIGATOR:** U.S. Geological Survey

**LOCATION:** Millers River Basin

**DESCRIPTION:** This project will begin to investigate the current sources of PCB's in the Millers River Basin by collecting and analyzing water samples.

Specific tasks will include:

1. deploying passive sampling devices at selected locations on the Millers River and Otter River;
2. measuring current velocity at each site during sample deployment to estimate the volume of water sampled by the passive samplers;
3. retrieving samplers and analyzing samples for PCB congeners;
4. calculating appropriate average concentrations of PCB's in the water during the sampling interval; and
5. report findings and recommendations for further investigation.

**COST:** \$80,000

**FUNDING:** \$50,000 by EOE  
\$25,000 by the Department of Environmental Protection  
\$5,000 by the US Geological Survey

**DURATION:** 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-06/MWI**

**PROJECT TITLE:** GIS Data Layers of Stormdrain Systems and Solutions to Hot Spot Problems

**INVESTIGATOR:** National Park Service

**LOCATION:** Shawsheen River Basin

**DESCRIPTION:** The propose of this project is to continue mapping and documenting storm drain system conditions and solve identified nonpoint source pollution problems in the Shawsheen River Basin.

Specific tasks will include:

1. review of existing storm drain maps and related information for each town;
2. recruitment and training of volunteers to locate storm drain and outlet pipes and record conditions;
3. collecting of GPS data for storm drains and outlet pipes;
4. preparing a storm drain report and GIS map for distribution to towns;
5. locating, mapping and describing "hot spot" nonpoint source pollution problems/sources;
6. preparing a draft and final action plan for resolving problems; and
7. implementing action plan

**COST:** \$73,500

**FUNDING:** \$35,000 by EOEA  
\$38,500 by NPS and Merrimack River Watershed Council

**DURATION:** 1999 – 2000



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-07/MWI**

PROJECT TITLE: Establishment of a Technical Advisory Committee for the Eel River Nutrient Management Plan

INVESTIGATOR: University of Massachusetts – Dartmouth

LOCATION: South Coastal Basin

DESCRIPTION: The purpose of this project is to establish and convene a multi-disciplinary Eel River Technical Advisory Committee (TAC) to assist resource managers evaluate nutrient related issues affecting the Eel River System in Plymouth.

The overall goal of the Eel River TAC is to help evaluate the nutrient related ecological health of the Eel River System under current conditions and to determine its potential change under projected alterations in nutrient loading.

Specific tasks will include

1. establishment of multi-disciplinary Eel River Technical Advisory Committee;
2. chair the TAC schedule, coordinate and conduct formal TAC meetings;
3. preparation of a report of the consensus of the TAC with recommendations.

COST: \$20,000

FUNDING: \$20,000 by EOEa

DURATION: 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-08/MWI**

PROJECT TITLE: An Assessment of Contamination of Coles Brook, Seekonk

INVESTIGATOR: University of Massachusetts – Dartmouth

LOCATION: Ten Mile River Basin

DESCRIPTION: This project will investigate the source of bacterial contamination in Coles Brook, a public water supply source for the town of Seekonk.

An assessment of potential nonpoint source pollution in the Coles Brook Watershed within the Zone 2 of the public water supply wells will be performed.

The study will be conducted in cooperation with the Seekonk Water District, National Resource Conservation Service and EOEA's Ten Mile River Watershed Team.

Specific tasks will include:

1. develop a GIS map of the surface waters of Coles Brook including the location of public water supply wells;
2. preparation of a Quality Assurance Project Plan (QAPP);
3. conduct water quality sampling during wet and dry weather conditions;
4. development of outreach materials,
5. assist project partners develop management recommendations; and
6. preparation of a final project assessment report and recommendations.

COST: \$10,000

FUNDING: \$10,000 by EOEA

DURATION: 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-09/MWI**

**PROJECT TITLE:** Assabet River Total Maximum Daily Load (TMDL) Investigations

**INVESTIGATOR:** U.S. Army Corps of Engineers – New England District

**LOCATION:** Concord (SUASCO)

**DESCRIPTION:** This project will collect information for use in determining a Total Maximum Daily Load (TMDL) for nutrients in the Assabet River.

Specific tasks will include:

1. establish an Assabet TMDL Technical Advisory Committee;
2. conduct a review and analysis of existing data on water quality, aquatic plants, algae;
3. perform a review of selected water quality models for use as potential tools for allocating nutrient loads;
4. develop a Quality Assurance Project Plan (QAPP);
5. conduct water quality sampling for nutrients under dry and wet weather conditions;
6. conduct biological sampling for aquatic plants and algae;
7. conduct sediment sampling; and
8. train citizen volunteer monitors.

**COST:** \$171,000

**FUNDING:** \$85,500 by EOE A  
\$85,500 by the US Army Corp of Engineers

**DURATION:** 1999 – 2000



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-10/MWI**

**PROJECT TITLE:** Hudson and Housatonic Watersheds Stormwater Assessment Project

**INVESTIGATOR:** Berkshire Regional Planning Commission

**LOCATION:** Hudson and Housatonic River Basins

**DESCRIPTION:** This project will identify and assess the extent of stormwater problems in the Hudson and Housatonic River Basins and identify potential solutions or projects for remediation.

Assessment activities in the Hudson Basin will focus on identifying vulnerable subwatersheds while work in the Housatonic Basin will focus on protecting lakes and ponds from identified stormwater problems.

Specific tasks will include:

1. Organize an advisory group to help guide the project and represent local concerns;
2. Develop and apply a decision-making process for prioritizing subwatersheds and lakesheds based on their vulnerability to storm water problems;
3. Develop a process for identifying viable stormwater remediation projects;
4. Organize and present a workshop for municipal officials and others; and
5. prepare a final report summarizing findings.

**COST:** \$100,445

**FUNDING:** \$100,445 by EOE A

**DURATION:** 1999 – 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-11/MWI**

**PROJECT TITLE:** Comprehensive Data Assessment in Selected Subwatersheds of the North Coastal Watershed

**INVESTIGATOR:** Salem Sound 2000

**LOCATION:** North Coastal Basin

**DESCRIPTION:** The purpose of this project is to review and compile water quality and other information in four subwatersheds in the North Coastal drainage area and identify data gaps.

The information will be used to help determine Total Maximum Daily Loads (TMDL's) for each identified subwatershed.

The findings of this study will be presented to local municipal employees and officials from planning boards, selectmen, city councils, Departments of Public Works and Boards of Health to help establish a link between the general concept of nonpoint source pollution and solutions to specific problems located within their respective communities.

Specific tasks will include:

1. selections of four subwatersheds which exhibit a common water quality or resource problems;
2. compilation and interpretation of pertinent data sets including water quality, land use and bioassessments;
3. identification of data gaps to be addressed in the next watershed cycle;
4. presentation of findings in coordination with local watershed associations and other stakeholder groups; and
5. preparation of a final report summarizing project activities.

**COST:** \$49,992

**FUNDING:** \$49,992 by EOE A

**DURATION:** 1999 – 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-12/MWI**

**PROJECT TITLE:** Pilot Project for Identification of Unmapped Tributaries and Intermittent Streams

**INVESTIGATOR:** U.S. Geological Survey

**LOCATION:** South Coastal Basin

**DESCRIPTION:** The purpose of this project is to develop and test statistically-based hydrologic methodologies that can be used to better identify perennial and intermittent streams as applicable to the Massachusetts Rivers Protection Act.

Specific tasks will include:

1. develop regression equations (i.e., statistical relation) relating the probability of average zero-flow to basin characteristics (e.g., drainage area) on a statewide basis for application to South Coastal Streams;
2. conduct field verification of no-flow points on selected streams as estimated by the zero flow equation developed; and
3. develop a digital data layer of intermittent and perennial streams.

**COST:** \$73,500

**FUNDING:** \$73,500 by EOE A

**DURATION:** 1999 – 2000



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-13/MWI**

**PROJECT TITLE:** Pilot Project for Technical Assistance to Local Officials on Environmental Strategies to Preserve, Protect and Restore Natural Resources

**INVESTIGATOR:** Metropolitan Area Planning Council

**LOCATION:** South Coastal Basin

**DESCRIPTION:** This project will provide technical assistance to local officials to protect and restore watershed resources, including water quality, habitat protection, and open space/recreation resources. The project will provide technical documents and circuit-rider planning assistance to communities, and provide residential build-out analyses for selected towns in the watershed.

Specific tasks will include:

1. prepare residential build-out analyses for two communities;
2. review local master plans and comprehensive plans, and open space plans and land acquisition priorities for Cohasset, Duxbury, Hanover, Marshfield, Norwell, Pembroke, Rockland and Scituate and make recommendations; and
3. provide technical assistance to Kingston, Pembroke and Plymouth for identifying opportunities for restoration to remedy major nonpoint source problem areas to foster regional coordination of management and protection provisions between communities, and to integrate water quality protection with local and regional planning.

**COST:** \$50,000

**FUNDING:** \$50,000 by EOEA

**DURATION:** 1999 – 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-14/MWI**

**PROJECT TITLE:** An Assessment of Causes of Water Quality Impairment in the Westfield River

**INVESTIGATOR:** Environmental Science Services, Inc.

**LOCATION:** Westfield River Basin

**DESCRIPTION:** The purpose of this project is to identify and assess the causes and sources of water quality impairment in the Westfield River. This will include water quality sampling during dry and wet weather conditions and aquatic macroinvertebrate and periphyton assessments.

Specific tasks will include:

1. develop a Quality Assurance Project Plan (QAPP);
2. conduct water quality sampling for nitrate-nitrogen, ammonia-nitrogen, total kjeldahl nitrogen, total and dissolved phosphorus, fecal coliform bacteria, dissolved oxygen, turbidity, specific conductance, pH, and temperature;
3. conduct biological assessments for aquatic macroinvertebrates and periphyton communities; and
4. identification of pollutant sources in descriptive and graphic form.

**COST:** \$49,900

**FUNDING:** \$49,900 by EOEA

**DURATION:** 1999

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-15/MWI**

**PROJECT TITLE:** An Investigation of Stormwater and Mainstem Loads of Bacteria, Nutrients and Selected Metals in the Lower Charles River Watershed

**INVESTIGATOR:** U.S. Geological Survey

**LOCATION:** Charles River Basin

**DESCRIPTION:** This project will collect water quality and streamflow in the Lower Charles River and tributaries. The information will be used to help focus regulatory and mitigation efforts on those practices having the most negative impact on water quality.

The objectives of this study are to:

1. determine annual and storm-event loads of bacteria, nutrients , and selected metals in the mainstem of the Charles River at the Watertown Dam, and evaluate the representativeness of samples presently being collected at this site by other organizations;
2. measure separate stormwater (non-combined sewer overflow) flows and contaminant loads to the Lower Charles River from the largest four sub-basins, and model the flows and loads generated by the entire Lower Charles Watershed from 3-month and 1-year design storms; and
3. determine containment concentrations in the Lower Charles mainstem at selected bridge cross sections immediately following the storm events sampled.

**COST:** \$842,000

**FUNDING:** \$105,937 by EOE  
\$308,000 by the Massachusetts Water Resources Authority  
\$245,000 by the U.S. Geological Survey  
\$19,063 by the Department of Environmental Protection  
\$164,000 by the U.S. Environmental Protection Agency

**DURATION:** 1999 - 2001



**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-16/MWI**

PROJECT TITLE: Technical Assistance for Water Quality Assessment Activities

INVESTIGATOR: Department of Environmental Protection

LOCATION: Statewide Massachusetts

DESCRIPTION: This contractor will be responsible for preparing water quality assessment reports, assisting in water quality monitoring efforts, developing new approaches for presenting and disseminating water quality information, and communicating with the public relative to assessment findings.

Specific tasks will include:

1. preparing water resource assessment reports using data and other appropriate information;
2. conducting meetings with various agency staff, citizen groups, municipal officials and consultants relating to resource assessments;
3. assisting in all aspects of water resource monitoring and assessment including project plan development, field monitoring, data management, data analysis and interpretation, and resource assessment reporting;
4. developing new approaches for presenting and disseminating water resource assessments; e.g., via the internet;
5. final review of all assessment reports to ensure the highest possible quality of product before dissemination; and
6. responding to public requests for water resource assessment information.

COST: \$50,000

FUNDING: \$50,000 by EOE A

DURATION: 1999 – 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-17/MWI**

**PROJECT TITLE:** Technical Assistance for Water Quality Monitoring Activities

**INVESTIGATOR:** Department of Environmental Protection

**LOCATION:** Statewide Massachusetts

**DESCRIPTION:** This contractor will perform environmental monitoring and assessment work and develop and maintain Quality Assurance/Quality Control (QA/QC) procedures for monitoring and data management for the Watershed Planning Program of the Massachusetts Division of Watershed Management (DWM).

Specific tasks will include:

1. evaluating all DWM data to assure that all QA/QC procedures are followed;
2. working with DEP's Wall Experiment Station to ensure that samples delivered to and data received from the laboratory have followed appropriate QA/QC procedures;
3. developing Standard Operating Procedures for all DWM field monitoring QA/QC and data recording QA/QC procedures;
4. assisting in all activities aspects of water resource monitoring and assessment including project plan development, field monitoring, data management, data analysis and interpretation, and resource assessment reporting;
5. researching current literature on field monitoring and QA/QC issues to ensure that DWM procedures are up-to-date and appropriate for the data objectives;
6. reviewing and commenting on all DWM Quality Assurance Project Plans (QAPP's) for completeness and accuracy; and
7. reviewing QAPP's and QA/QC information for data received from external sources and determining the level of usefulness in making water resource assessments.

**COST:** \$50,000

**FUNDING:** \$50,000 by EOEA

**DURATION:** 1999 – 2000

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MASSACHUSETTS WATERSHED INITIATIVE PROJECT 99-18/MWI**

**PROJECT TITLE:** Seasonal Support for Water Quality Monitoring and Laboratory Activities

**INVESTIGATOR:** Department of Environmental Protection

**LOCATION:** Statewide Massachusetts

**DESCRIPTION:** The seasonal support staff will participate in water quality and biological monitoring programs of the Division of Watershed Management and assist in the functions and operations of the Division of Environmental Analysis of the Wall Experiment Station.

Specific tasks will include:

1. participate in water quality and ecological field surveys by calibrating sampling equipment, obtaining field samples, delivering samples to the analytical laboratory, and processing biological samples;
2. participate in the sampling and analysis of fish, aquatic macroinvertebrate and algal populations and their habitat;
3. participate in stream discharge measurements and other hydrological techniques;
4. assist in compiling and entering field and laboratory environmental monitoring data into electronic databases;
5. assist with water data analysis and report preparation;
6. prepare environmental samples for analysis;
7. operate and maintain laboratory instrumentation;
8. maintain accurate records of samples analyzed and of analytical results; and
9. participate in laboratory quality assurance programs.

**COST:** \$75,000

**FUNDING:** \$75,000 by EOE A

**DURATION:** 1999





